6. 衛生動物学（長谷川　　恩）

まえがき

衛生動物部門の活動は、本プロジェクト開始第４年目の１９７９年４月、長谷川のタイ国着任を以て始動した。然し実質的には、同年１０月に専用研究室が開設せられて漸く本格化したと言うべきであろう。

こゝに至る約６ケ月間は、Provincial Chief Medical Office（以下P.C.M.O. と略称）の性病検査室に於て、その一隅を借りての、不自由な業務遂行を余儀なくされた。

もっとも、この間にもDepartment of Medical Sciences（ＤＭＳ）Division of Medical Entomology（ＤＭＥ）が、Chantaburi 地区に於て実施したカの駆除作業並びに生態調査に同行し、その実情を見聞した他、他部門の現地調査にも能うる限り同行し、其の後のタイ国における当部門の業務を実施する上に、少なからぬ知見を得たことは、長谷川個人としては誠に有益であった。

更に、若し研究室の完成を待って着任ということになれば、果して１０月を以て業務開始が可能であったか否かは甚だ問題であり、加えて、現在使用中の面積の確保は恐しく不可能であったと想像される所から、種々の行き違いはあったにせよ、長谷川が４月に着任したことは、結果としてよかったと考えられる。

但し、着任前に予期し得なかった受入態勢の不備から、当初予定していた業務計画は、大巾な変更を余儀なくされた。即ち、着任前年、東京においてＤＭＥ部長Boonluan PHANTHUMACHINDA 博士との業務計画打合せの際最初に手がけることになっていた「住家性ネズミに関する調査」は、研究室が使用可能となった１１月まで延期せざるを得なかったし、カ・ハエ・ゴキブリなどの衛生昆虫類に関する基礎調査は、設備、人的資源の問題が整わぬため、未着手である。

然し、反対に、来年度以降、余力があった場合に実施する予定であった、当地区住民の寄生虫感染状況の調査は、当初長谷川が置かれた条件下にあっての実施可能な唯一の業務として、意外に進捗を見た。

今一つ、当部門業務の重要事項として、３月３日、国立予防衛生研究所、衛生昆虫部、虫疫室長、安富和男博士の短期専門家としての来タイがあった。同博士は力の有機燐剤抵抗性調査のための新技法、薄層ゲル免疫電気泳動法の技術指導を目的としての祈遣もあった。同博士の滞在は、僅か２０日間に過ぎなかったが、この受入態勢については万全を期し、後述する如き一応の成果を以て、３月２３日帰国した。このことは、現地において充分の準備がなされ得るならば、極めて短期間の専門家の派遣も、相当の成果を期待し得るということの実証として評価できるであろう。

以下、各項目ごとに業務内容を述べる。それぞれの詳細に関しては、各項末尾に記した

Project Report of Mecical Zoology (Report) を参照されたい。

1) 寄生虫調査

これまで当地区における人体寄生虫症に関する調査としては、Prapokklao 病院並びに4地区病院の検査室において、日常業務として実施される入院及び外来患者に関するもの、及び昨年度、当プロジェクトが実施した学童の細菌学的調査の際に併せて行われた検査成績がある。然し、これらの成績は、まとまった形では公表されてはおらず、且、その検査は直接塗抹法によるものであった。

まえがきにも述べた如く、昨年度の前半6ヶ月は、当部門の業務活動の場はP.C.M.O.の性病検査室の一隅に限られており、使用可能な用具もDMEより貸与された顕微鏡1台のみに過ぎなかった。従ってこの条件下にあって最高の能率を挙げ得る調査項目として、集卵法による寄生虫調査を取りあげた。

幸、この検査実施に必要な採便管・遠心管・ロートなどの器材、並びにアンチフォルミン・エーテル・フォルマリンなどの化学薬品類は、当プロジェクト細菌部門及び生化学部門の好意ある援助によって、一通り整えることが出来たし、その他の不足器材・薬品類はBangkokにおいて入手が可能であった。

然し、最も必要な遠心器に関しては、業務の能率的な実施のため、日本よりタイ側に供与されている新しいものの一時借用を申し入れたが、タイ側の同意を得られず、結局検査室で現在使用されていない古い型のものが貸与されることとなった。この面に関しての協定については鮮かではないが、日本側の供与器材が、タイ側の一方的な裁量によって、徒らに死蔵されていることは問題であろう。

検査方歩は、より正確な成績を得る為、長谷川がこれまで手がけてきた「八百技法」による沈澱集卵法を採用した。検体の集取については、それぞれの地区のHealth Center のSanitarian 並びに Mid Wife の全面的な協力を得、更にP.C.M.O.職員の好意ある援助を受けて、特に大きな支障なく行われ得た。

検査対象は、本プロジェクトの実験対象地区である3つのTambon 即ち Sal-Khao(376名)、Tagad-Ngao(470名)、Bo(467名)の主として小学生、Bo の飲食店従業員及びその家族(277名)、更に新しく当プロジェクトの多角的綜合調査対象地区として取り上げられた、Tambon Toong-Ben-Cha の Village No.1 の一般住民(132名)の合計1,722名である。

これらの調査の結果、Chantaburi 地区においては、鉤虫が最も重要な寄生虫であることが指摘される。全般的に当地域にあっては、便所の普及度が低い。更に便所の設備がある

場合でも、農村地帯の常として、労働に従事する場所と自宅とが離れている為、労働時間中の使用は殆ど考えられない。こうした状況から、この地域にあっては、土壌中に鉤虫の感染仔虫が存在する可能性が高く、加えて彼らの裸足での生活が、一層本寄生虫へ感染率を高めているものと考えられる。

鉤虫以外の寄生虫としては、8種が検出された。これらの中 Tagad－Ngao のべん虫（Trichuris trichiura）及び、同じく Tagad－Ngao と Bo における蛔虫（Ascaris lumbricoides）が比較的高い感染率を示している。

その他注目すべき問題としては、Sai－Khao の一学童に肝蛭（Fasciola hepatica）虫卵が検出されたことと、2例の肝吸虫（Opistorchis Sp.）感染者が認められたことが挙げられる。前者は、本来は、牛・水牛などの家畜寄生虫であり、最近の調査は行なわれていない様であるが、その寄生率は全国的に可成り高いと予想される。従って、これらへの家畜の排泄物によって汚染された水溜りには本吸虫のミランディウムの存在は当然考えねばならず、こうした場所での水浴・水泳・漁などは、感染の機会となり得ると言わねばならない。後者は、タイにおいては、北部、東北部農村地帯において、高率の寄生を見る吸虫であり、今回の調査結果は、むしろ低いと考えられるかも知れぬ。

以上の調査結果をとりまとめて第1表として示す。尚、本項関係の発表論文は、次の5篇である。

- HASEGAWA,M.,POLPRUKSA,P.,JUTAJAND,H.,CHIAKOM,P.& L.VONGCHAUN (1979)
  Survey on parasitic infection in school children in Tambon Sai-Kha
  Project Report of Medical Zoology, No. 1
- HASEGAWA,M.,POLPRUKSA,P.,JUTAJAND,H.,WAITHUM,P.& R.CHAISOOK (1979)
  Survey on parasitic infection in restaurant personnel and their families in Tambon Bo.
  Project Report of Medical Zoology, No. 2
- HASEGAWA,M.,POLPRUKSA,P.,JUTAJAND,H.,SINGSCEREE,S.& SINGSCEREE (1979)
  Survey on parasitic infection in school children in Tambon Tagad-Ngao.
  Project Report of Medical Zoology, No. 4

- HASEGAWA,M.,POLPRUKSA,P.,JUTAJAND,H.,CHINDAPANTA,P.& S.CHARNKIT (1980)
  Parasitological survey on inhabitants in Tambon Toong-Ben-Cha.
  Project Report of Medical Zoology, No. 6
- HASEGAWA,M.,POLPUKSA,P.,JUTAJAND,H.,WAITHUM,P.& R.CHAISOOK. (1980)
  Survey on parasitic infection in school children in Tambon Bo.
  Project Report of Medical Zoology, No. 7.

第1表 Chantaburi 地区における寄生虫調査成績

Subjects of survey	No. of examined			No. of positive								
	M.	F.	Total	Ss	Ev	To	HW	Tt	Al	Fh	Op	Tae
Sai-Khai Child.	211	165	376	14	2	6	126	3	2	1		
Tagad-Ngai Child.	253	217	470		14	11	102	55	27		1	
Bo Children	222	245	467	2	1	3	123	1	14		1	
Bo Restaurant	127	150	277	5	2	5	49		1			1
Toong-Ben-Cha.	63	69	132	3	1	4	63					
Total	876	846	1722	24	20	29	543	59	54	1	2	1

Remarks Ss = Strongyloides stercolaris
Ev = Enterobius vermicularis
To = Trichostrongylus orientalis
HW = Hook worm
Tt = Trichuris trichiura
Al = Ascaris lumbricoides
Fh = Fasciola hepatica
Op = Opistorchis sp.
Tae= Taenidae sp.

ぎょう虫（Enterobius Vermicularis）は、人体内寄生虫としては特殊な生態を示し、一般的な糞便検査によってはその寄生の実態を知ることは困難である。然し、第1表に見る如く、今回の調査においては、殆ど毎回の検査に於て、若干の陽性者が検出され、本寄生虫の感染がこの地区における一つの問題を提供していることが予想された。こうした理由に基き、この寄生虫の正確な感染状況を把握する目的で、Scotch tape法による調査を実施した。

但し、現地においては、この目的の為に作製されている検査用紙の入手が不可能であったので、この調査に使用するスライドは、総て手造りで準備せねばならなかった。調査対象はBo（３９８名）、及びSai－Khao（１９７名）の1才から１２才までの子供５９５名で、後者については、調査は尚継続中である。

また、第2表に示した結果は、一検査対象に対して一回のみの検査結果であるが、本来、この寄生虫検査は同一人につき、最低連続3日の検査が要求される。但し、手技としては比較的単純であるので、将来、タイ側が独自にこの検査を発展させることを期待したい。

この検査に関連し、公表した論文は次の1篇である。

• HASEGAWA,M.,POLPUKSA,P.,JUTAJAND,H.,WAITHUM,P.& R.CHAISOOK (1979)
Survey on pin-worm infection in school children in Tambon Bo.
Project Report of Medical Zoology, No. 3

第2表　Chantaburi 地区におけるぎょう虫調査成績

	No. of examined	No. of positive	%	No. of examined	No. of positive	%
1 - 5 Under School age	145	21	14.5	181	31	17.1
6 - 12 School Children	124	39	31.5	145	56	38.6
Total	269	60	22.3	326	87	26.7

2) 住家性ネズミ調査

当初、タイに於て先ず開始する予定であったこの調査は、充分なベースを有する研究室・解剖用具を初めとする多様な器材・麻酔用並びに標本保存用の多量の薬品・更に最も重要なるMan－Powerといった各種の条件の整備のために、約半年の開始延期を余儀なくされた。

然し、DMEの全面的な協力により、Mr.Mongcol CHENCHITTIGUL(Entomologist)が定期的に毎月2週間出張し、彼と共に6名の補助表か、捕鼠器の設置・回収、捕獲ネズミの集収の野外作業から、研究室における麻酔・測定・解剖・内外寄生虫の採集などの室内作業までを担当することになった他、この調査専用にトラック1台が貸与されるという態勢が整い、加えて、細菌学的検索に関しては、伊藤武専門家他タイ側の学者が、内部寄生虫検索についてはDMSのSomchai DAENGPIAM 博士の協力を仰ぐといった万全の実施態勢を以て、11月より研究業務を開始した。

調査対象地区としては、Chantaburi、市内(これを調査実施の都合上5地区に分けた)、並びに Tagad－Ngao Bo Sai－Khao及び Toong－Ben－Cha の9地区とし、毎月2地区づつについての調査を行なった。

この調査は、2月を以て一応9地区につき各一回の実施を終了、引続き3月からは第2回目の調査を継続中であるが、第1回に関しては、各地区毎に20戸を選び、この同一家屋に対して捕鼠器4個を、連続3日間設置するという方法を採用した。従って第1回の調査の延捕鼠器設置数は2,160個、これによって捕獲したネズミその他は438個体である。尚第2回以降は捕鼠器設置戸数を5戸増加して、各地区25戸とし(但し、中20戸は第一回と同一家屋)実施中である。捕獲したネズミ類は、麻酔下に、体重・体長の測定、採血(血液寄生虫検査用)、外部寄生虫の採集を行ない、次に屠殺後、その性成熟度：妊娠状況を調査、更に腸管内容物を対象とする細菌学的な検体の採取を実施する。残余の内臓諸器官は内部寄生虫検索の為に固定、最後に頭骨及び毛皮を種類固定用標本とした。

以上の如く、ネズミを対象とした、極めて多岐にわたる調査を行ない、非常に興味ある知見を得つつある。これらの結果は、次にかかげる報告書として、近く公表する予定であるので、こゝでは第1回調査において捕獲されたネズミ類の結果について、とりまとめて第3表として示すに止める。

尚、本調査に関連して、我々は調査対象9地区についての、可成り精度の高い地図を作製しつつある。元来、公衆衛生の仕事を進めるに際しては、対象地区の正確なる基礎データと共に、その地図を持つことは絶対に必要な条件である。この必要性を理解するという上においても、この作業の持つ意義は大きいと言うべきであろう。

第3表　Chantaburi 地区における住家性ネズミ捕獲成績

Species	Z-1	Z-2	Z-3	Z-4	other	C-N	T-N	B o	S-K	T3C	Total
R.nor.	90	37	24	28		16	2				197
R.exul.	22	7	21	46	4	20	33	20	17	7	197
R.rat.					3		6		1		10
B.ind.									1		1
B.sav.									2		2
C.mur.	9	1	9	4		4					27
N.D.							1			3	4
Total	121	45	54	78	7	40	42	20	21	10	438

Remarks
R.nor. = Rattus norvegicus
R.exul. = Rattus exulans
R.rat. = Rattus rattus
3.ind. = 3 andicota indica
3.sav. = 3 andicota savilei
C.mur. = Crocidura murina

Z-1,Z-2,Z-3,Z-4,other C-N belongs to Chantaburi
C-N = Chantanimit
T-N = Tagad Ngao
B o = Bo
S-K = Sai-Khao
TBC = Toong Ben Cha

本項関連の論文は、次の如く目下作製中である。

• HASEGAWA,M.,CHENCHITTIGUL,M.,DAENGPIAM,S.,ITOH,T.,PHAN-URAI,R. & C.SOROS (in progress)

Studies on house-rodents in Chantaburi district.

Project Report of Medical Zoology, No. 8

3) 殺虫剤抵抗性調査

安富専門家の派遣については、数年以前からその実現が望まれていた。この業務の必要資材も前以て選付され、ＤＭＥ及び長谷川が保管していたが、その適否の判断は、安富氏自身のチェックを待つ必要があった。同氏の到着後の点検の結果、型式が希望のものと異るもの、現品の送付されていないもの等が認められ、業務実施に際し無用の神経を使うこととなった。この点の事前連絡を密にすることをＪＩＣＡ当局に希望する。

以上の如き不測の事態はあったが、安富・長谷川間には、派遣実現前、数次にわたっての書簡連絡が行なわれ、比較的スムースにその目的を達し得たものと判断する。

今回の手技は、ＤＭＥにおいて数名のスタッフが習得した他、現在本プロジェクトより日本に派遣されつつあるＤＭＥのEntomologist も安富氏により訓練を受け、今後タイにあっても、この方面の進歩が大いに期待し得るものと考えられる。

この詳細は、次の論文としてまとめて公表した。

• YASUTOMI,K.,SAMUTRAPONGSE,W.,BOONYABANCHA,S.,VATANACHAI,P.,PHANTHUMACHINDA,B. & M.HASEGAWA (1980)

Studies on esterase activity in Culex pipiens fatigans and Aedes aggypti. Project Report of Medical Zoology, No. 5

4) 研究室の開設

本部門の研究調査を行うに当っては、当然ながら研究室の確保を必要とする。然し、その業務内容が特殊であるため、これまで本プロジェクトの研究室として使用していたPrapakklao病院の検査室を共同使用することは、物理的な狭隘さの理由からだけでなく不可能であった。

こうした理由から、新しくP.C.M.O.内に研究室を設けることが予手されていた。本来は長谷川の着任前に完成し、4月以降この場所での研究業務が開始される筈であったが、その工事は着任時、全く未着手であった。然し、かえって長谷川の希望の容れられ得る余地のあった点は、むしろ幸であったと言える。

工事は漸く7月に着手され、9月に一応の完成を見た。但し、日本の場合に比べると、その内容は粗雑であり、素人目にも日本側の投じた工事費に相応するものとは考え難い。更に、Chantaburi 地区においては、電力の供給状況が極めて不安定で、検鏡中にも顕微鏡の視野が激しく明るさを変化させ、加えて2月以降は水道の供給が停止し、所謂研究室としての機能を果すには程遠い内容である。

然し、使用面積だけは十分に確保され、又本分野の専用研究室として出発した為、従来の病院検査室の場合の如く、他の検査業務に関する配慮を必要としない点は恵まれていると言える。面積は約48m^2、これに24m^2の専門家用居室（現在、公衆衛生の前川専門家と共同使用中）を加え、2月以降はAir－conditioningの設備も始動した。内部の諸設備は、特に新設研究室としての予算を与えられないため、遅々としてではあるが、徐々に整備しつつある。

5) 次年度以降の業務計画

既に第2回の調査を開始した住家性ネズミの調査はそのまゝ継続される。然し、5、6月は、DMEの力の駆除プログラムの関係で一時中断されることになろう。

寄生虫に就ては、初年度に明らかにした鉤虫感染を始とする寄生虫の駆虫並に予防対策の樹立を目標とした調査、研究が行なわれる予定である。

カ・ハエ・ゴキブリ等の衛生昆虫全般に関する調査は、当然着手する。但し、この業務の為に必要な標本整理の資材が不足である。従って、当初の規模は可成り制約を受けざるを得ない。

尚、次年度、カの個体群生態学に関する短期専門家の派遣がタイ側より要請され、タイ側の counter part の人選も決定している。この業務は chantaburi 地区を中心として実施する計画であるが、その受入態勢に関しては、事前の打合せを綿密にし、十分の成果を挙げ得る様配慮する。

尚、本プロジェクトは、次年度を以て終結することになるが、本部門に関して言えば、取り上げるべき数多くの問題を残している。仄聞するごとく、本プロジェクト自体の延長が実現するならば、その事は衛生動物部門にとっても、極めて望ましい事と考える。勿論、その際には、単なる期間の延長ではなく、全く新しい構想を以て対応することとなろう。

7. 昭和５４年度　地域保健活動向上計画・活動経緯（調整員　樋田　俊雄）

１．昭和５４年度　活動実績

１－１　専門家及び調査団の派遣について（敬称略）

昭和５４年度の専門家派遣は、１）医動物学　長谷川　恩　　2）細菌学　伊藤　武　3）食品分析学　豊田正武　　４）公衆衛生学　前川秀幸　　5)ウィルス学　五十嵐　章　６）医動物学　安富和男及び　７）調整員　渡辺正夫の７名であった。

このうち１年以上の長期派遣専門家は、１）～４）までの専門家及び調整員であった。尚、５）については派遣期間が１ヶ月　６）については３週間であった。

派遣期間等は下記の通り

	氏　名	分　野	派　遣　期　間	所　属　先
1	長谷川　恩	医動物学	昭和54年4月10日～昭和56年4月 9日	ナ　シ
2	伊　藤　武	細　菌　学	昭和54年4月21日～昭和55年4月20日	東京都衛生研究所
3	豊　田　正　武	食品分析学	昭和54年8月11日～昭和55年8月10日	国立衛生試験所
4	前　川　秀　幸	公衆衛生学	昭和54年9月 5日～昭和55年9月 4日	神奈川県立小田原保健所
5	五十嵐　章	ウィルス学	昭和55年1月25日～昭和55年2月24日	大阪大学
6	安　富　和　男	医動物学	昭和55年3月 3日～昭和55年3月23日	国立予防衛生研究所
7	渡　辺　正　夫	調　整　員	昭和55年3月13日～昭和56年3月31日	J.I.C.A

従って、昭和５４年度の派遣専門家数は、昭和５２年度に赴任した。１）チームリーダー熊岡爽一　２）調整員　樋田俊雄　昭和５３年度に赴任した　生化学　宮崎武夫を含め合計１０名となった。尚、樋田調整員は任期を終了し３月２３日帰国した。

本年度内に派遣された調査団数は１、人数は総計３名であった。調査団の派遣目的は、１）プロジェクトの総括的な検討及び各専門家に対する指導、２）プロジェクトの実施に係る事項について各専門家との打合せ、３）R／Dの延長問題に関するタイ側及び専門家との打合せであった。派遣期間は昭和５４年９月２０日から同年同月２７日までの約１週間であり、団長は、医療協力部長　山本二郎、団員は北里大学公衆衛生学教授　植松稔及び医療協力部職員　道下高一であった。

また、昭和５４年７月１０日より１５日まで、本プロジェクトの食品衛生部門の特別アドバイザーとして、厚生省薬務審議官　本橋信夫が派遣された。

１－２　研修員の受け入れについて

昭和５４年度の研修員受け入れは８名であった。これで昭和５１年度からの研修員

受け入れ総数は３４名となった。今年度受け入れ研修員のうち１年間の研修は２名、６ヶ月１名、４ヶ月１名、１ヶ月以内が４名であった。

研修員の氏名、研修先、所属機関等は下記の通り

	氏名 / 所属先	研修先	期間	備考
1	Dr Vimol Notananda (Director General of Department of Medical Sciences)	国立衛試 北海道衛研等	昭和５４年１０月１１日～ 昭和５４年１１月２日	高級
2	Mr Ura Gaeurhaiyo (Director Position & Pay Div. Civil Service Commission)	同上	同上	準高級
3	Mr Wanchai Namwong (Staff of Provincial Health Laboratory, Chanthaburi)	大阪大学等	昭和５４年１０月２７日～ 昭和５５年１０月２６日	
4	Miss Kanitha Vatcharasingha (Staff of Clinical Pathology Div. Dept. of Medical Sciences)	都衛研等	同上	
5	Mr Poonyos Reorangboonya (Staff of Medical Entomology Div. Dept of Medical Sciences)		昭和５５年１月１０日～ 昭和５５年７月９日	
6	Dr Suwat Sernpanichkit (Director of Tamai District Hospital)		昭和５５年３月２０日～ 昭和５５年４月２１日	
7	Dr Tawin Kliniumol (Director of Pong Num Rong District Hospital)		同上	
8	Dr Danai Danuuiratthana (Head of Dept. of Preventive & Social Medicine, Prapokklao Hospital)	東京大学等	昭和５５年３月２０日～ 昭和５５年７月２０日	

１－３ 機材供与及び携行機材について

昭和５４年度の機材供与は下記の通り

	船名	C・I・F BKK	B／L & 保険証券№	主要機材
1	TG 601 (5 Feb 1980)	¥ 272,525	B/L 217-08791532 保 313108558 (KOA Fire & Marine	シンクロスコープ
2	TG 601 (14 Feb 1980)	¥ 1,185,499	B/L 217-08791576 保 313108731	Reagent

3	Maritime Champion (Time Line) (21 Feb 1980)	¥27,557,064	B/L NB 0017 保 313108801	Clinical Refractometre他
4	TG 601 (2 April 1980)	¥ 834,934	B/L 217-08791753 保 313900130	Supplement A 他
5	Eastern Anna (20 March 1980)	¥ 2,943,162	B/L YBK-41 保 313109086	Agar Pawder 他
6	Pipat Samut (4 April 1980)	¥13,944,888	B/L K-42 保 Ic/TE-E 30791	Power Boad 他
7	Thomas Everette (2 April 1980)	¥ 835,202	B/L Y-7-B 保 Ic/TE-E 30469	Pump
8	Pipat Samut (3 April 1980)	¥ 2,162,021	B/L K-32 保 Ic/TE-E 30790	Radio Equipment
	Total	¥49,729,295		

本年度に送付された携行機材は下記の通り

１９７９年度　携　行　機　材

	Name of Expert	Flight №	Shipping date	B/L Number	C.I.F BKK	Remarks
1	M. HASEGAWA	JL 461	15 April '79	131-54935333	¥ 662,560	
2	T. ITOH	JL 717	28 April '79	131-54976202	¥ 410,920	
3	T. MARUYAMA	JL 463	22 May '79	131-55042190	¥ 580,400	
4	M. HASEGAWA	JL 465	24 May '79	131-55042676	¥ 1,118,052	
5	T. ITOH	JL 717	26 May '79	131-55039434	¥ 743,523	
6	To the Project (保険求償)	AZ 779	09 Aug '79	055-53603351	¥ 35,075	
7	S. KUMAOKA	JL 473	16 Aug '79	131-55464636	¥ 164,790	
8	M. TOYODA	JL 463	14 Sept '79	131-55545081	¥ 917,579	
9	H. MAEKAWA	by Ship	04 Oct '79	YHBK-9	¥ 354,993	
10	T. ITOH	JL 717	29 Dec '79	131-56055952	¥ 576,810	
11	S. Kumaoka	TG 717	14 March '80	217-08791661	¥ 158,090	
	Total				¥ 5,722,792	

1－4　レポートの発行について

昭和５４年度に発行されたレポートは下記の通り

i) 〝 Promotion of Provincial Health Services Project 〃　－英文－

31 May 1979

Department of Medical Sciences, Ministry of Public Health

Japan International Cooperation Agency

ii) タイ国地域保健活動向上計画　報告書　Ⅲ

昭和５４年１０月

国際協力事業団

iii) 〝 Promotion of Provincial Health Services Project 〃　－英文－

Interim Report

January 1980

Department of Medical Sciences, Ministry of Public Health

Japan International Cooperation Agency

尚、本プロジェクトに係るレポートについては、昨年度までに

１）　タイ国医療協力基礎調査団報告書　（昭和50年2月医74－32　(1221)）

２）　タイ国地域保健活動向上計画総合報告書　（昭和52年1月医76－14　(163)）

３）　タイ国地域保健活動向上計画報告書　Ⅰ　（昭和52年8月医77－(12)－(175)）

４）　タイ国地域保健活動向上計画報告書　Ⅱ　（昭和54年2月医＝ＪＲ　79－2）

が発刊済みである。

1－5　プログレス　レポートについて

昭和５４年度のプログレスレポートは、下記の４点が発行された。

1－5－1　Promotion of Provincial Health Services　№Ⅱ

April ～ June 1979

1－5－2　Promotion of Provincial Health Services　№Ⅲ

July ～ September 1979

1－5－3　Promotion of Provincial Health Services　№Ⅳ

October ～ December 1979

1－5－4　Promotion of Provincial Health Services　№Ⅰ

January ～ March 1980

1－6　コーディネーテングコミッティーについて

昭和５４年度のコーディネーテング　コミッティーは、各メンバーの日程の調整がつかず、課題を各メンバーにサーキュレートして承認を得ることとなった。

なお、サーキュレートの回数は３回であった。

Progress Report No. II

Project: Promotion of Provincial Health Services

April - June 1979

The progresses of all activities are moving steadily and smoothly during the period. As the result of bacteriological examination of tap water and well water in Chanthaburi municipal area showed that water is not suitable for drinking from contamination of enteropathogenic organisms, which the measures will be adopted for improving of the situation soon.

1. Fellowship

It is expected that eight fellowships will be provided in 1979 which is now under consideration by the Japanese side.

2. Expert

2.1 Dr. T. Maruyama, expert in Bacteriology, left on 1 May 1979.

2.2 Dr. M. Hasegawa, expert in Entomology, arrived on 10 April 1979.

2.3 Dr. T. Itoh, expert in Bacteriology, arrived on 24 April 1979.

3. Project's activity

3.1 Activity I

3.1.1 Strengthening of the PHL as a clinical laboratory

1. Clinical chemistry

Another lot of known lyophilized sera was supplied by Japanese expert for studies of accuracy and precision of the tests routinely performed in clinical chemistry. The result will be reported later.

2. Clinical Hematology

a. Automation of white blood cell count

Number of specimen and test: 3424

b. Platelet count, phase-contrast method

Number of specimen and test: 471

c. Prothrombin time

Number of specimen and test: 43

3. Clinical microbiology and Blood banking

No further progress due to shortage of personnels, inadequate laboratory spaces and lack of appropriated instruments.

3.1.2 Strengthening of the PHL as a public health laboratory

1. Serodiagnosis of Dengue and DHF suspected patients

   Number of specimen: 19

2. Examination of feces for surveillance of diarrheal diseases

   Number of specimen from PCMO: 730

   Number of specimen from Prapokklao Hospital: 2886

3. Bacteriologic examination of food and water

   a. Food : Number of specimen: 37

   b. Water : Number of specimen: 36

3.1.3 Strengthening of the SRL in the three district hospitals and one district health and medical center

Under the technical supervision of Chanthaburi PHL and Prapokklao Hospital, with the supplies of equipments and reagents from the project, laboratory activities of the four SRLs were performed as follows:

1. TAMAI DISTRICT HOSPITAL

   A. MICROBIOLOGY

- Gram stain-Pathogens	= 2	tests
- AF stain - TB	= 4	"
- Blood parasitology - Malaria	= 802	"
- Stool parasitology, Protozoa-helminths	= 2	"

   B. HAEMATOLOGY

- Haematocrit	= 75	"
- Haemoglobin	= 12	"
- WBC count	= 67	"
- Differential WBC count	= 67	"

   C. URINE ANALYSIS = 179 "

- Pregnancy test	= 11	"

2. KLUNG DISTRICT HOSPITAL

   A. MICROBIOLOGY

- Gram stain-G.C.	= 1	test
- AF stain-TB	= 2	tests
- Blood parasitology-Malaria	= 195	"
- Stool parasitology, protozoa-helminths	= 30	"

   B. HAEMATOLOGY

- Haematocrit	= 1	test
- Haemoglobin	= 113	tests
- WBC count	= 158	"
- Differential WBC count	= 47	"

C. URINE ANALYSIS = 208 tests

3. PONG NAM ROM DISTRICT HEALTH AND MEDICAL CENTER

A. MICROBIOLOGY

- Gram stain-Pathogens = 1 test
- Gram stain-G.C. = 2 tests
- AF stain-TB = 1 test
- Blood parasitology-Malaria = 442 tests
- Stool parasitology, protozoa-helminths = 53 "

B. HAEMATOLOGY

- Haematocrit = 1 test
- Haemoglobin = 2 tests
- WBC count = 2 "
- Differential WBC count = 2 "
- Others = 9 "

C. URINE ANALYSIS = 19 "

4. LAEMSINGHA DISTRICT HOSPITAL

A. MICROBIOLOGY

- Blood parasitology-Malaria = 240 tests
- Stool parasitology, protozoa-helminths = 33 "

B. HAEMATOLOGY

- Haematocrit = 25 "
- Haemoglobin = 25 "
- WBC count = 25 "
- Differential WBC count = 25 "

C. URINE ANALYSIS = 115 "

- Pregnancy test = 3 "

3.2 Activity II

3.2.1 DPHLS

1. Media and chemical reagents have been supplied by DPHLS to PHL Chanthaburi.

2. In the last annual meeting on Laboratory Management held by DPHLS at Songkla, the Japanese experts have given cooperation by presenting articles at the meeting.

3.2.2 DFA

1. Collection of food samples for microbiological examination and chemical analysis has been carried out in the model areas, Chanthaburi during 26 - 28 March 1979, for a total of 113 samples. The results are as follows:

a. Microbiological examination. From 52 samples examined, food poisoning bacteria were found in 6 samples namely:- dried chili and raw oyster from A. Laemsingh, Thai cookies ( ) from A. Klung, fermented fish ( ) and salted turnip ( ) from A. Pong Namron.

b. Chemical contaminants.

- Pesticide residues: Thirtysix samples of dried beans, eggs, rice, fruits and vegetables were analysed for pesticide residues. Low level of residues were found in 15 samples. Only one sample of dried mung bean from A. Laemsingh contained 0.15 ppm of endrin which exceeded the U.S. guideline level (0.05 ppm.)
- Aflatoxins : The total of 14 samples were analysed for aflatoxins. Two samples of peanut products from A. Klung were found to be contaminated in the higher level than the maximum limit.
- Mercury : Three samples of marine products were detected for mercury. The amount of mercury found was in the safety limit.

c. Food Additives:

Colors, preservatives and Borax were detected in 8 samples. Only one kind of Thai cookie ( ) from A. Klung contained food color :- auramine, Rhodamine B, and green color which do not allow to be used in food.

2. Research work: Study on Nitrosamine in food under the supervision of Dr. H. Ishiwata.

N-Nitroso compounds in river fish, marine fish and their products were determined as dimethylamine by thin layer chromatography and gas chromatography. The level of 1.6-62 and 2-250 ppm. of dimethylamine were found in raw and processed fishes respectively. The concentration of dimethylamine in processed cuttle fish, squid and shrimp were observed to be 7 to 50 times higher than their raw status.

3.2.3 VRI

1. Production and standardization of arbovirus antigens during April - June 1979.

Dengue-4 SA antigen	0.5 ml. x 188 amps.
Chikungunya SA antigen	0.5 ml. x 34 "
Normal SA antigen	0.5 ml. x 38 "

2. Preparation of reference antisera.

Reference sera prepared from positive DHF patient sera:-

0.5 ml. x 160 amps.

3. Supply of arbovirus antigen to PHL Chanthaburi

Positive serum control from DHF 0.5 ml. x 5 amps.

3.2.4 DME

The activities of DME in Chanthaburi during the months of April to June 1979 are as follows:

1. Aedes aegypti surveys in three localities in Chanthaburi pre and post Abate and Malathion Applications. The results are as follows:-

Results of Aedes aegypti Landing collection in Chanthaburi study areas.

Province	Location surveyed	Date (1979)	Day after Rx		No. Mos. per man hour			% Female Reduction
			Abate	Mala.	Female	Male	Total	
Chanthaburi	Municipality	21-5	B*	B*	5.8	3.6	9.4	
		23-5	Malathion		Application			
		30-5	Abate		Application			
		29-6	30	37	3.5	2.2	5.7	39.7
	Klung	19-5	B*	B*	4.1	1.3	5.6	
		26-5	Malathion		Application			
		8-6	Abate		Application			
		28-6	20	33	2.1	2.6	4.7	48.8
	Tamai	19-5	B*	B*	5.1	2.4	6.5	
		28-5	Malathion		Application			
		6-6	Abate		Application			

B* = Before pesticide application

Results of Larval densities in treated areas in Chanthaburi.

Province		Chanthaburi							
Location		Municipality		Klung			Tamai		
Date (1979)		21/5		29/6	19/5		28/6	19/5	
Days after	Abate	(B)		30	(B)		20	(B)	
Treatment	Malathion	(B)		37	(B)		33	(B)	
No. of houses examined		150	Mala. Rx 23/5, Abate 30/5	400	150	Mala. Rx 26/5, Abate 8/6	105	150	Mala. Rx 28/5, Abate Rx 6/6
No. of houses positive		102		137	112		35	97	
Aedes House Index		68.0		34.3	74.6		33.3	64.7	
No. Containers examined		840		2394	706		573	1026	
No. Containers positive		296		270	263		61	285	
Receptacle Index		35.2		11.3	37.3		10.6	27.8	
Breteau Index		197.3		67.5	175.3		58.1	190.0	
Total Outdoors Containers		238		521	205		148	363	
% positive outdoors		45.4		13.2	44.4		12.8	30.3	
Total Indoor Containers		602		1873	501		425	663	
% positive indoors		31.2		10.7	34.3		9.8	26.4	

2. Abate applications were carried out to 19 communities, 6,325 houses, covering 40,986 population.

3. Malathion applications were carried out to 27 communities, 9,013 houses covering 58,850 population.

The possible relationship of the DHF prevalence and the Aedes aegypti control efforts could reflect the following cases of DHF in Chanthaburi.

Number of DHF Reported Cases
in Chanthaburi

1971	378	with	0	Deaths
1972	978	"	12	"
1973	664	"	6	"
1974	207	"	2	"
1975	708	"	5	"

5 years average: 587 with 5 deaths

1976	160	with	0	Deaths
1977	276	"	8	"
1978	216	"	0	"

3 years average: 217 with 3 deaths

1979	21	with	0	Deaths (January - June)

3.2.5 DCP

1. Ninety eight specimens were received from PHL Chanthaburi for a confirmation and typing of organisms as follows:

a.	Salmonella	4
b.	Enteropathogenic E.coli	82
c.	V.cholerae	12

2. Supply of antisera and antigens to PHL Chanthaburi

a.	Salmonella antisera	3 ml.
b.	Shigella antisera	6 ml.
c.	E.coli antisera	14 ml.
d.	V.cholerae antisera	25 ml.
e.	Salmonella antigen	4400 ml.

3.2.6 Cholburi

Report of the laboratory activities of hospitals in Cholburi province during April - June 1979 are as follows:

1. Cholburi Hospital

	April	May	June
Bacteriological examination	2996	4466	3860
Serological examination	401	540	494
Parasitological examination	4735	4708	4914
Mycological examination	153	175	189
Haematological examination	8240	8487	8145
Clinical Chemistry examination	3343	3197	2810
Spinal fluid examination	252	156	246
Urine examination	3930	4546	4689
Sanitation	18	-	20
Others (Media prep. etc.)	94234	171200	134357

2. Panatnikhom District Hospital

	April	May	June
Blood film for parasites	262	285	341
Complete Blood count	262	285	341
Blood Chemistry	82	82	111
Blood for VDRL	141	165	176
Blood for serology test	47	47	60
Stool examination	54	45	43
Urine examination	835	876	254
Microbiology	183	148	167

3.3 Activity III

3.3.1 Detection of intertinal parasites including the treatment of positive cases in Tambon Saikao, Pong Namron district are now being undertaken.

3.3.2 It is hoped that the volunteer communicators in Tambon Saikao will follow the reporting system in the near future after the family survey and preparation of family folder has finished.

3.4 Activity IV

No training activities were done during this period according to the schedule.

3.5 Activity V

3.5.1 Operational research in Virology

1. Sero-epidemiological surveys of arboviruses in Chanthaburi

The analysis of the results of the serological examination of sera collected from Chanthaburi in 1978 - 1979 is being undertaken.

2. Isolation and Identification of dengue virus from DHF patient sera

a. Anti-dengue fluorescent conjugate prepared from immune human sera were determined for the relative potency by testing against a known positive source. The optimum dilution is 1:4 when positive fluorescence is at a maximum and non-specific staining is at a minimum. The standardization of this conjugate was also confirmed by AFRIM.

b. Seven acute phase plasma of patients from Siriraj Hospital were attempted for virus isolations using insect cells (

cell line, mammalian cell (LLC-MK_2), and intrathoracic Toxorhychites splendens mosquitoe inoculation. One strain of virus was isolated from mammalian cell. The identification and typing is under study.

3.5.2 Analysis on causative agents of G-I diseases

1. Detection of enteropathogenic microorganisms from diarrheal patients between April - June 1979

As seen before, Shigella and Vibrio parahaemolyticus showed higher incidence. Cholera was found in May 1979 and Vibrio cholerae was detected from 10 cases. Since one of enteropathogens, Plesiomonas Shigelloides was added to the examination system, 29 cases in May and 21 cases in June were detected. This finding clarified that some diarrhea can occur due to this organism. (Table 1)

Table 1 Results of bacteriological study on diarrheal patients in the Provincial hospital and four district hospitals

	April	May	June
Number of rectal swab and stool	963	1,550	1,203
Isolated enteropathogenic organisms			
V. cholerae	0	10	0
NAG Vibrio	0	5	2
V. parahaemolyticus	20	71	66
Shigella	57	70	50
Salmonella	18	39	4
Enteropathogenic E. coli	54	88	53
Plesiomonas shigelloides	Not tested	29	21

2. Bacteriological survey during Cholera outbreak

Early detection of Cholera patients, bacteriological determination of contacts and investigation of infection route have been tried. Quick and efficient action in localizing the infection in patients' families or neighbours have been carried out. In individual case, bacteriological examination was carried out on the stock of food and drinking water. However, infection source or route could not be detected yet. (Table 2)

Table 2 Outbreaks due to V. cholerae and results of bacteriological examination

	1	2	3	4
Date	9 May	13 May	19 May	22 May
Place of occurrence	Chaloong Klung	Bangachai Laemsing	Bangachai Laemsing	Tabchai Pongnamron
Number of patients	1	1	6	1
Number of death	0	0	0	0
Bacteriological examination				
Patient	1/1*	1/1	6/6	1/1
Family	0/7	0/4	0/13	0/6
Other contacts	0/17	0/15	0/17	0/5
Foods	0/7	0/10	0/11	0/4
Water	0/1	0/4	0/4	0/2

* Number of positive/Number of specimens

3. Epidemiological survey on enteropathogens among school children

In this period, enteropathogens were studied in Tambon Saikao. Incidence of Shigella carriers is the same as other two field tambons. But, that of Vibrio parahaemolyticus is markedly low. This indicates different feature representing characteristic pathogens distributed in respective field area. It is to be noted that Plesiomonas shigelloides was detected from 6 healthy children.

The follow-up study of pathogens positive cases revealed negative results after administration of Metrim (Trimethoprim and Sulfomethoxazole). Table 3

Table 3 Carring rate of enteropathogenic organisms among school children in tambon Saikao

Number of examination	275
Number of positive cases	11 (4.0 %)
V. cholerae	0
NAG Vibrio	1
V. parahaemolyticus	2
Shigella	1
Salmonella	1
P. shigelloides	6

4. Bacteriological examination of tap water and well water in Chanthaburi municipal area

There was no evidence that chlorination had been done adequately in the Chanthaburi water supply centre. A considerable number of E.coli group was detected from the tap water. P.shigelloides was detected from water obtained at water supply centre. The complete sterilization is desirable.

From well water available in the municipal area (Wat soun Ma-Mong and a school) E.coli group was detected. This would not be suitable for drinking unless it is effectively treated by boiling or other adequate procedure. (Table 4)

Table 4 Bacteriological examination of drinking water in Chanthaburi City

Place	Cl	pH	Total count/ml.	E.coli group/ml.	Pathogenic organism
Water supply center	-	7.5	260	2	P.shigelloides
Water treatment center	-	6.0	160	0	
PHL	-	6.0	61	3	
Bangacha	-	7.8	25	2	
Wat Soun Ma-Mong (Well water)	-	6.0	56	11	
Siridat school (Well water)	-	6.0	110	16	

3.5.3 Research on Community Participation in Health Promotion

Drs. Sujarti and Prayoon from the Division of Epidemiological Surveillance, Ministry of Public Health went to Chanthaburi for a follow up study on 25 - 27 April 1979. They have discussed with Thai authorities and Japanese experts in Chanthaburi on the project activities concerning operational research on community participation. They also met volunteer communicators in Tambon Tagad-Ngao and Tambon Bo.

As a result of the study, the following conclusions were led:

1. Diarrheal and febrile patients will be reported to the second class health centres every morning by volunteer communicators, so that health officers may be able to take a necessary measure.

2. Every day report from a volunteer communicator is kept at the second class health centres and summarized results will be sent to the PCMO.

Thus, real situation at the village level is being figured out by using this way of report. At the same time, health officers can respond to the report quickly and efficiently. Wireless telecommunication system will promote this sort of activity when it becomes available.

June 29, 1979

Soichi Kumaoka, M. D.
Japanese Expert Team Leader

Sutas Guptarak, M. D.
Project Director

Progress Report No. III

Project: Promotion of Provincial Health Services

July - September 1979

The study on enteropathogens of fecal specimens obtained from food handlers in Chanthaburi showed that food shop may play a fairly big role as one of infection sources. It is hoped that the suitable preventive measures will be formulated and carried out by Chanthaburi PCMO.

1. Expert

Dr. Hajimu Ishiwata, expert in Food Analysis, left on 24 August 1979.

Dr. Masatake Toyoda, expert in Food Analysis and Instrumentation, arrived on 11 August 1979 and will stay for one year.

Dr. Hideyuki Maekawa, expert in Public Health, arrived on 5 September 1979.

2. Mission

2.1 The mission headed by Dr. Nobuo Motohashi visited the project on the purpose of technical guidance for Food Analysis on 10 - 15 July 1979.

2.2 JICA consultation team headed by Dr. Jiro Yamamoto visited the project on 20 - 27 September 1979, for discussing with the Thai authorities concerned on the further implementation programme of the project.

The members of the team are

1. Dr. Jiro Yamamoto, Director, Department of Medical Cooperation, JICA.
2. Professor Minoru Uematsu, Kitazato University.
3. Mr. Kouichi Michishita, staff, Department of Medical Cooperation, JICA.

3. Project's activity

3.1 Activity I

3.1.1 Strengthening of the PHL as a clinical diagnostic laboratory

1. Clinical chemistry

Another lot of lyophilized sera was supplied by the Japanese expert for running of quality control. The results of analyses are as follows:

	Type of Determinations (test)	Number of examination (n)	$\bar{X}$	SD	RCV %
1.	Sodium (Na)	51	147	2.26	1.53
2.	Potassium (K)	52	55	0.26	4.72
3.	Chloride	21	95	5.4	5.68
4.	Glucose	46	198	19.17	9.68
5.	Cholesterol	44	249	19.16	7.69
6.	Total protein	31	6.25	0.49	7.84
7.	Albumin	32	3.56	0.62	17.7
8.	Urea N	49	60.77	6.99	11.52
9.	Creatinine	48	4.01	0.37	9.22

Note: All tests were performed under routine conditions which subjected to variation & errors, therefore the RCV were expected to be higher than OCV.

2. Clinical Hematology

2.1 Automated white blood cell count,
Number of specimen & test : 4298

Note: No. of automated red blood cell count = 146

2.2 Platelet count, phase - contrast method
Number of specimen & test : 632

2.3 Prothrombin time
Number of specimen & test : 48

3. Clinical microbiology & Blood banking
No further progress

3.1.2 Strengthening of the PHL as a public health laboratory

1. Serodiagnosis of Dengue and DHF suspected patients
- Number of specimen : 26
- Number of recent Dengue infection detected: 6

2. Examination of feces for surveillance of diarrheal diseases

2.1 - Number of specimen from PCMO : 616
- Number of positive of enteropathogens : 72

2.2 - Number of specimen from Prapokklao Hospital:1824
- Number of positive for enteropathogens : 329

3. Bacteriologic examination of food and water

3.1 Food, number of specimen = 14

3.2 Water, number of specimen = 34

3.1.3 Strengthening of the SRL in the three district hospitals and one district health and medical center

The Laboratory activities during the period of three months (July - September 1979) are as follows:

1. TAMAI DISTRICT HOSPITAL

A. MICROBIOLOGY

- Blood parasitology - Malaria = 896
- Stool parasitology - Protozoa:
  Helminths = 70

B. HAEMATOLOGY

- Haematocrit = 60
- Haemoglobin = 6
- WBC count = 60
- Differential WBC count = 60

C. URINE ANALYSIS = 171

- Pregnancy test = 5

2. KLUNG DISTRICT HOSPITAL

A. MICROBIOLOGY

- Gram stain - Pathogens = 3
- Gram stain - G.C. = 3
- AF stain - TB = 3
- Blood parasitology - Malaria = 224
- Stool parasitology - Protozoa: Helminths= 1

B. HAEMATOLOGY

- Haematocrit = 3
- Haemoglobin = 147
- WBC count = 171
- Differential WBC count = 100

C. URINE ANALYSIS = 158

3. LAEMSINGHA DISTRICT HOSPITAL

A. MICROBIOLOGY

- AF stain - TB = 6
- Blood parasitology - Malaria = 322
- Stool parasitology - Protozoa: Helminths= 13

B. HAEMATOLOGY

- Haematocrit = 86
- Haemoglobin = 77
- WBC count = 86
- Differential WBC count = 85

C. URINE ANALYSIS = 65

3.2 Activity II

3.2.1 DPHLS

1. Chemical reagents, bacteriological media and antisera have been supplied regularly by DPHLS to PHL Chanthaburi during July to September 1979.

2. Laboratory equipments listed below have been supplied to PHL Chanthaburi during July to September 1979.

- Refrigerator, Model ER-4	1 set
- Centrifuge, Model SC-15 AR	1 set
- Immune - Electrophoresis Apparatus	1 set
- Accessories for Hitachi Spectrophotometer, Model 200-20	1 set
- Refrigerator, Model R-117 AH	4 sets
- Over head projector, Model H.P. 2600	1 set
- 16 mm Projector, Model 16 AA	1 set
- Automatic Blood cell counter, Model Hc-300	1 set

3. Laboratory equipments listed below have been supplied to PHL Cholburi during July to September 1979.

- Refrigerator, Model R-117 AH	5 sets
- Hematocrit Centrifuge, Model Rc-24 BN	1 set
- Electro-phoresis Apparatus	1 set
- Trinocular Microscope, Model BHB 331	2 sets
- Fluorescence Microscope, Model BHB 342	1 set
- Centrifuge, Model 05 P-21	5 sets

3.2.2 DFA

1. Collection of food samples for checking of contaminants, additives and food-poisoning bacteria was carried out in Chanthaburi for the total of 94 samples during 10 - 12 September 1979 by PCMO and DFA officials accompanied by Dr. M. Toyoda. The results are as follows:

a. Microbiological examination: Thirty five food samples were examined for sanitary index and food-borne pathogens. Escherichia coli was detected in 2 samples of Chicken curry and fermented fish. Clostridium welchii was found in four samples: crab meat and 3 kinds of fermented fish.

Two drinking water were found under quality of the microbiological standards.

b. Chemical contaminants

Pesticide residues: DDT and endrin within limited level were detected in 16 out of the 27 samples.

Mercury: Traces of mercury, not exceeding max. limit, were found in all of the 8 samples.

c. Food additives: Fifty six samples were determined for food colors, preservatives and Borax. Prohibited colors were detected in 26 of the 34 samples. Four out of 14 samples were found to contain benzoic acid higher than the limited level. Borax was not found in any of the 8 samples examined.

d. Quality according to standard: Four canned food, 2 cooking oil and 2 beverage samples were analysed. One cooking oil and 2 beverage samples did not meet the standards.

2. Under the supervision of Dr. M. Toyoda, development of methods of analysis has been studied as follows:

a. Determination of some food preservatives.

b. Analysis of Vit. E by gas liquid chromatography.

c. Plastic identification by ignition tests.

d. Study on Nitrosamine in food were determined in dried fish. Not more than 5 ppb were found in few samples.

Many kinds of dried fish and dried shrimp were examined for secondary amine. It was found that dried shrimp contains secondary amine higher than others.

3.2.3 VRI

1. Production and standardization of arbovirus reagents

a. Production of antigens

Chik. SA antigen	0.5 ml. x 51 amps
Dengue - 2 SA antigen	0.5 ml. x 78 amps
Normal SA antigen	0.5 ml. x 99 amps

b. Production of reference antisera

- Positive control sera

Pool DHF 0.5 ml. x 70 amps

- Immune sera

Antisera to dengue type 4 was prepared in 2 monkeys (Macaca Nemestrina) by 0.5 ml. subcataneous and intravenous injection of 10^3 to 10^4 plaque forming unit. Serum was harvested one month post inoculation and every 2 weeks after first bleeding. The liters of the antisera assayed by HI test were 1:80 from homologous titer. The result is unsatisfactory because of the susceptibility of monkeys.

3.2.4 DME

1. Three local staff (temporary employees) have been trained to do surveillance and control of Aedes aegypti, rodent collection, dissection, preparing and preserving the specimens for further studies.

2. The study areas for DHF ecology study were mapped and classified into four zones according to the types of the houses they were urban residential houses (U.R.), urban shop houses (U.S.), suburban residential houses (S.R.), suburban shop-houses (S.S.). The zones are divided into subzones such as UR 1 to UR 4, US 1 to US 4, SS 1 to SS 2, SR 1 to SR 2. Number of houses in the areas were counted the Aedes - aegypti relative densities in each area were monitored.

3. A zoology laboratory was established in Chanthaburi PCMO, the furnitures and equipment were installed and ready to be used by the end of September.

3.2.5 DCP

1. One hundred forty six specimens were received from PHL Chanthaburi for typing as follows:

a.	Salmonella	55
b.	E.coli	90
c.	Others	1

2. Supply of antisera and antigens to PHL Chanthaburi:

a.	Salmonella antisera	18 ml.
b.	Shigella antisera	17 ml.
c.	Enteropathogenic E.coli	15 ml.
d.	Salmonella antigen	7,000 ml.

3.2.6 Cholburi

Report of the laboratory activities of hospitals in Cholburi province during July - September 1979 are as follows:

1. Cholburi Hospital

	July	August	September
Bacteriological examination	3,741	2,517	3,191
Serological examination	536	486	425
Parasitological examination	4,582	4,560	4,979
Mycological examination	203	184	230
Haematological examination	9,413	8,251	7,987
Clinical Chemistry examination	3,732	3,699	3,365
Spinal Fluid examination	246	354	280
Urine examination	4,802	4,631	4,273
Sanitation	17	19	61
Others (Media prep. etc.)	103,228	133,003	144,114

2. Panatnikhom district hospital

	July	August	September
Blood film for Malarial Parasites	268	366	443
Complete Blood Count	268	366	443
Blood Chemistry	71	118	97
Blood for VDRL	141	212	143
Blood for Serology test	57	56	65
Stool Examination	33	60	46
Urine Examination	850	604	784
Microbiology	133	215	258

3. Banglamung district hospital

	July	August	September
Sputum Exam.	8	9	7
Gram Stain	56	92	60
Blood Film for Parasites	87	86	104
V.D.R.L	60	76	108
Pregnancy Test	35	24	37
Urine Examination	74	86	146
Complete Blood Count	21	27	29
Haematocrit	63	57	96
Stool Exam and Culture	52	50	28

3.3 Activity III

Now the activities in reporting of death, birth, fever and diarrhea are being carried out by only volunteer communicators in the model areas along the policy of the project, after the discussion among the Project Director, Provincial Chief Medical Officer and the officers concerned, in November 1979 at Chanthaburi province, have been made.

3.4 Activity IV

No training activities were done during this period due to unavailability of the trainees.

3.5 Activity V

3.5.1 Operational research in Virology

Isolation and identification of dengue virus

From 68 heparinized blood samples collected from Siriraj Hospital using mosquito cell line, LLC-MK_2 and intrathoracic mosquito inoculation, 8 strains of viruses were isolated. All of isolated viruses produced CPE in $C_6/36$ only at the second passage. Two dengue type 2 and one dengue type 4 were identified by FAT technique the identification of another 5 strains is undertaken.

3.5.2 Analysis on causative agents of G-I diseases

a. Detection of enteropathogenic microorganisms from diarrheal patients

Bacteriological study on causative bacteria of acute diarrheal patients seen at hospitals in Chanthaburi province showed some tendency in incidence pattern except for V.cholerae which was found 417 cases in February to October 1978 and 10 cases in May 1979 and was not found in other period. It is supposed that there would be a fairly big number of V.parahaemolyticus infection in a province like Chanthaburi. But, the laboratory results showed that the biggest etiological agent in specimens sent from hospitals was Shigella (29.0 %). (Table) It is imagined that shigellosis usually manifests severer symptoms than V.parahaemolyticus infection and needs medical treatment more often.

Examination of Plesiomonas shigelloides was added to the routine work in the Provincial Health Laboratory from May 1979. The incidence of this microorganism in acute diarrheal patients was 9.3 % in May 1979, although its pathogenicity has not been fully established.

Table Results of Bacteriological Study on Diarrheal Patients in the Provincial Hospital and four District Hospitals in Chanthaburi Province from May 1978 to September 1979

	Case	%
V.cholerae	427	12.8
NAG Vibrio	88	2.6
V.parahaemolyticus	906	27.0
Shigella	1084	32.3
Salmonella	186	5.6
E.coli	661	19.7
Total	3352	100.0
Plesiomonas shigelloides (determined from May 1979)	80	

b. Examination on enteropathogens of fecal specimens obtained from food handlers and their families in Chanthaburi province

The laboratory results so far showed that outbreak of dysentery was mostly sporadic and there had not been massive family infection. This suggested that food shop may play a fairly big role as one of infection sources. The biggest number of acute diarrhea due to Vibrio parahaemolyticus has been found, in spite of the fact that people have not in a custom to eat raw sea foods. Therefore, hygienic supervision on food shops must be very important for a preventive measure of intestinal infections among people.

As the first step for public health service to food shops in the province, examination on enteropathogens from food handlers and their families has been done. In this study, 284 fecal specimens from food handlers and their families were collected in Tambon Bo, one of the field tambons. As shown in Table, 24 cases (8.5 %) were detected enteropathogens. Detection rate of Vibrio parahaemolyticus and Salmonella was high. Shigella was found in one case. Enteropathogens were found highest in adults over 15 years. Being prepared food by those persons is rather dangerous in terms of contamination of food or water by carriers, so that hygienic education or supervision for food handlers is necessary.

Results of enteropathogenic bacteria among persons of the food shop at Tambon Bo

Age	No. of specimens	No. of positive	Shigella	NAG Vibrio	Salmonella	V. parahaemolyticus	P. shigelloides	Edwardsiella tarda
1 - 4	34	2(6.3%)	-	-	-	-	1	1
5 - 14	92	5(5.4%)	-	2	-	2	1	-
15 - 64	145	17(11.7%)	1	-	5*	11	-	-
Over 65	6	0	-	-	-	-	-	-
Unknown	7	0	-	-	-	-	-	-
Total	284	24(8.5%)	1	2	5	13	2	1

* One person was isolated two organisms, Salmonella and V.parahaemolyticus.

September 28, 1979

Soichi Kumaoka

Soichi Kumaoka, M. D.
Japanese Expert Team Leader

Sutas Guptarak, M. D.
Project Director

Progress Report No. IV

Project: Promotion of Provincial Health Services

October - December 1979

Beside from general progresses of all activities during the period, there are some more studies on the causative agents of gastro-intestinal diseases which will enable the health authorities to improve the situation in the future.

Project's Activity

1. Activity I

1.1 Strengthening of the PHL as a clinical diagnostic laboratory

1. Clinical chemistry

Two lots of known lyophilized sera were used for study and running of quality control. The results of analyses are as follows:

Quality control (30 Oct. - 28 Dec. 1979)

	Consera (C 2)				C 1 (Abnormal)				Tonks
	N	Mean	S.D	*CV(%)	N	Mean	S.D	*CV(%)	C.V(%)
Glucose	25	125.04	2.83	2.26	25	208.28	4.13	1.98	10.0
Cholesterol	43	171.88	12.20	7.10	38	239.-	17.39	7.27	10.0
T. Protein	42	6.01	0.34	5.76	37	6.10	0.28	4.72	7.1
Albumin	42	3.39	0.30	8.88	37	3.45	0.20	5.81	6.2
Na	44	130.56	1.98	1.51	41	148.14	2.79	1.88	2.2
K	44	4.35	0.11	2.52	40	5.56	0.13	2.42	8.0
Cl	41	94.79	3.99	4.20	37	97.13	4.86	5.0	2.0
A.L.P.	33	27.16	7.17	26.39	29	49.81	11.03	22.1	10.0
G.O.T.	41	13.65	7.96	58.31	36	48.38	12.65	26.1	10.0
G.P.T.	42	11.30	8.10	71.68	37	49.29	14.0	28.4	10.0
T. Bilirubin	42	0.51	0.23	45.0	38	1.29	0.55	42.7	10.0
B.U.N	24	17.09	1.64	9.59	24	63.16	7.23	11.4	10.0
Creatinine	42	0.95	0.14	14.7	37	3.84	0.42	10.9	10.0
Uric acid	21	4.26	0.23	5.39	16	8.40	0.64	7.6	10.0

* Since all tests were performed during the routine conditions, therefore the CV is actually a RCV.

2. Clinical Hematology

a. Number of white blood cell count, automated method: 4553

b. Number of red blood cell count, automated method : 52

c. Number of platelet count, phase-contrast method : 658

d. Number of test, prothrombin time : 42

3. Clinical microbiology and blood banking: No further progress

4. Virology

a. Detection of HBs Ag and Anti HBs

After completion of one-year-training in virus laboratory in Japan, the medical technologist returned to Chanthaburi PHL and set up the laboratory for detection of HBs Ag and Anti-HBs. The activity will be commenced in January 1980.

b. Serodiagnosis of Dengue and DHF suspected patients

Due to remarkable fall of infection within this period, only 5 cases were detected among 9 specimens examined.

1.2 Strengthening of the PHL as a public health laboratory

1. Examination of feces for surveillance of diarrheal diseases,

a. Number of specimen from PCMO : 42

Number of positive cases for enterophthogens : 7

b. Number of specimen from Prapokklao Hospital : 1970

Number of positive cases for enteropathogen : 464

2. Bacteriologic examination of food and water

a. Food : No specimen submitted

b. Water: Number of specimen : 44

1.3 Strengthening of the SRL in the three districts hospital and one district health and medical center

The laboratory activities of four SRLs during the period of three months are listed as follows:-

1. TAMAI DISTRICT HOSPITAL

A. MICROBIOLOGY

- Gram stain - Pathogens = 6
- Gram stain - G.C. = 2
- AF stain - TB = 1
- Wet preparation - Fungi = 3
- Blood parasitology - Malaria = 1152
- Stool parasitology - Protozoa: Helminths = 74

B. HAEMATOLOGY

- Haematocrit = 241
- Haemoglobin = 53
- WBC count = 244
- Differential WBC count = 244

C. URINE ANALYSIS = 247

- Pregnancy test = 11

2. KLUNG DISTRICT HOSPITAL

A. MICROBIOLOGY

- Gram stain - Pathogens = 4
- Gram stain - G.C. = 4
- AFB stain - TB = 1
- Blood parasitology - Malaria = 1168
- Stool parasitology - Protozoa: Helminths = 384

B. HAEMATOLOGY

- Haematocrit = 22
- Haemoglobin = 179
- WBC count = 190
- Differentiated WBC count = 142

C. URINE ANALYSIS = 403

- Pregnancy test = 6

3. LAEMSINGHA DISTRICT HOSPITAL

A. MICROBIOLOGY

- AF stain - TB = 8
- Blood parasitology - Malaria = 253
- Stool parasitology Protozoa: Helminths = 8

B. HAEMATOLOGY

- Haematocrit = 105
- Haemoglobin = 107
- WBC count = 107
- Differential WBC count = 18

C. URINE ANALYSIS = 120

4. PHONG NUM-RON DISTRICT HEALTH AND MEDICAL CENTER

A. MICROBIOLOGY

- Gram stain - G.C. = 1
- Blood parasitology - Malaria = 983

B. URINE ANALYSIS = 28

2. Activity II

2.1 DPHLS

Chemical reagents, bacteriological media and antisera have been supplied regularly by DPHLS to PHL Chanthaburi and Chonburi during October to December 1979.

2.2 DFA

1. Analysis results of 94 food samples collected from Chanthaburi during 10 - 12 September 1979 are as follows:

a. Microbiological examination: Thirty five food samples were examined for sanitary index and food-borne pathogens. Escherichia coli was detected in 2 samples: Crab meat and 3 kinds of fermented fish. Two drinking water were found under quality of the microbiological standards.

b. Chemical contaminants

Pesticide residues: DDT and endrin within limited level were detected in 16 out of the 27 samples.

Mercury: Traces of mercury, not exceeding max. limit, were found in all of the 8 samples.

c. Food additives: Fifty six samples were determined for food colors, preservatives and Borax. Prohibited colors were detected in 26 of the 34 samples. Four out of 14 samples were found to contain benzoic acid higher than the limited level. Borax was not found in any of the 8 samples examined.

d. Quality according to standard: Four canned food, 2 cooking oil and 2 beverage samples were analysed. One cooking oil and 2 beverage samples did not meet the standards.

2. Under the supervision of Dr. M. Toyoda, chemical analyses of food has been carried out in the following subjects:-

a. Determination of Sulfur dioxide in dried food. Various kinds of dried food, mainly noodles, were analysed for sulfur dioxide (SO_2), a bleaching agent, as free and combined form by using Fujita Modified Rankine method. Ranges of 7.7-151.0 and 24.8-209.2 ppm of SO_2 were found in samples of glass noodle (wun-sen) and rice noodle, thread form (sen-mee), respectively. So_2 was not detected in rice noodle both large and small band forms.

b. Determination of histamine in seafood is under investigation.

2.3 VRI

1. Sero-epidemiological surveys of arbovirus in Chanthaburi

1083 blood specimens of post epidemic season were collected from healthy people in 2 Tambons of Chanthaburi Province in December 1979. The determination for HI antibody are undertaking.

2. Production and standardization of arbovirus reagents

A. Production of antigens during October - December 1979

Den-2 SAPr antigen 0.5 ml. x 301 amps

Den-2 Seed 0.5 ml. x 22 amps

B. Production of reference antisera

Immune sera

Antisera to Dengue type-3 was prepared in two monkeys (Maccaca nemestrina) by 0.5 ml. subcutaneous and intravenous infection of 10^3 to 10^4 plaque forming units (pfu). Serum was harvested 1 month post inoculation and every two weeks after 1st bleeding. The standardization of antisera was undertaken.

2.4 DME

During the months of October to December 1979 the DME team in Chanthaburi was engaged mostly in the rodent study. The study was carried out in five areas: Municipality zone I, III, IV, Tagad Ngao village 4, Banbo village 5, 6. Rodent traps were placed in these areas the animals captured were killed, identified for species, collected ectoparasites the livers were dissected for endoparasites, some parts of small and large intestines were sent for baccili study, hearts, lungs and parts of intestines sent to the parasitology section, Division of Clinical Pathology, for endoparasite study.

The general flea indicies were ranging from 0.2 to 1 and average 0.4. Besides fleas count, mites and lices were also collected and identified.

The endo-parasites in livers found were animal parasites not human. The human endoparasites found in the internal organs are reported separately by the DCP. Details of results are given in the tables I to VI, the study areas in the figures I to V.

Table I Summary of Trapping Results

Study area	Municipality zone I		Municipality zone III		Municipality zone IV		Tagud Ngao Vil. 4		Ban Bo. Vil. 5, 6	
Date trapped	Oct. 15 - 18		Nov. 26 - 29		Dec. 17 - 20		Nov. 19 - 22		Dec. 11 - 14	
Details of study	No. Coll.*	Cumm.**	No. Coll.	Cumm.	No. Coll.	Cumm.	No. Coll.	Cumm.	No. Coll.	Cumm.
No. Nights (traps placed)	3		3	9	3	15	3	6	3	12
Total traps set	240		240	720	240	1200	240	480	240	960
Total rats Captured	62		54	133	66	219	17	79	20	153
Avg. No. traps/night	80		80	80	80	80	80	80	80	80
Avg. No. Animals/night	20.7		18.0	14.8	22	14.6	57	13.2	6.7	12.8
Capture rate	25.8		22.5	18.5	27.5	18.2	7.0	16.5	8.3	15.9
No. houses animals captured	19		18		18		6		12	
Avg. No. rats captured in one house	3.1		2.7		3.3		.85		1.0	
Max. No. rats captured in one house	6		6		8		10		4	

* No. Coll. = Number Collected

** Cumm. = Cummulative number

Table II Summary of the Animal Species and Number Captured

Area	Municipality zone I		Municipality zone III		Municipality zone IV		Tagad Ngao Vil. 4		Ban Bo. Vil. 5, 6	
Date	Oct. 15 - 18		Nov. 26 - 29		Dec. 17 - 20		Nov. 19 - 22		Dec. 11 - 14	
Details of study	No. Coll.	Cumm.	No. Coll.	Cumm.	No. Coll.	Cumm.	No. Coll.	Cumm.	No. Coll.	Cumm.
Rattus norvegicus	40		24	64	27	91	0	40	0	64
Rattus exulans	18		21	55	38	113	16	34	20	75
Rattus rattus	0		0	1	0	1	1	1	0	1
Crocidura murina	3		9	12	1	12	0	3	0	12
Total	61		54	132	66	218	17	78	20	152

Table III Summary of Host Flea Data

Area	Host	No. examined	No. Infected	% Infected	Total Flea	GI*	SI**
Chantaburi Municipality Zone I	Rattus norvegicus	40	8	20.0	17	0.4	2.1
	Rattus exulans	18	6	33.3	6	0.3	1.0
	Crocidura murina	3	-	-	-	-	-
		61	14	23.0	23	0.4	1.6
Tagad-Ngao Village No. 4	Rattus exulans	16	5	31.2	8	0.5	1.6
	Rattus rattus	1	-	-	-	-	-
		17	5	29.4	8	0.5	1.6
Chantaburi Municipality Zone III	Rattus norvegicus	24	5	20.8	11	0.5	2.2
	Rattus exulans	21	4	19.0	5	0.2	1.2
	Crocidura murina	9	5	55.6	9	1.0	1.8
		54	14	25.9	25	0.5	1.8
Ban Bo Village No. 5, 6	Rattus exulans	20	5	25.0	7	0.4	1.4
Chantaburi Municipality Zone IV	Rattus norvegicus	27	10	37.0	15	0.6	1.5
	Rattus exulans	38	10	26.3	13	0.3	1.3
	Crocidura murina	1	-	-	-	-	-
		66	20	30.3	28	0.4	2.8
Total		218	58	26.6	91	0.4	1.6

*GI = General Flea Index

**SI = Specific Flea Index

Table IV Summary of Host Ectoparasite Data

Area	Host	No. examined	Mite			Lice		
			No. Infected	% Infected	Total	No. Infected	% Infected	Total
Chantaburi Municipality Zone I	Rattus norvegicus	40	26	65.0	79	-	-	-
	Rattus exulans	18	3	16.7	6	-	-	-
	Crocidura murina	3	-	-	-	-	-	-
		61	29	47.5	85	-	-	-
Tagad-Ngao Village No. 4	Rattus exulans	16	6	37.5	16	-	-	-
	Rattus rattus	1	-	-	-	-	-	-
		17	6	35.3	16	-	-	-
Chantaburi Municipality Zone III	Rattus norvegicus	24	22	91.7	397	-	-	-
	Rattus exulans	21	8	38.1	24	1	4.8	1
	Crocidura murina	9	3	33.3	6	-	-	-
		54	33	61.1	427	1	1.8	1
Ban Bo Village No. 5, 6	Rattus exulans	20	3	15.0	7	-	-	-
Chantaburi Municipality Zone IV	Rattus morvegicus	27	22	81.5	386	-	-	-
	Rattus exulans	38	12	31.6	34	-	-	-
	Crocidura murina	1	-	-	-	-	-	-
		66	34	51.5	420	-	-	-
Total		218	105	48.2	955	1	0.4	1

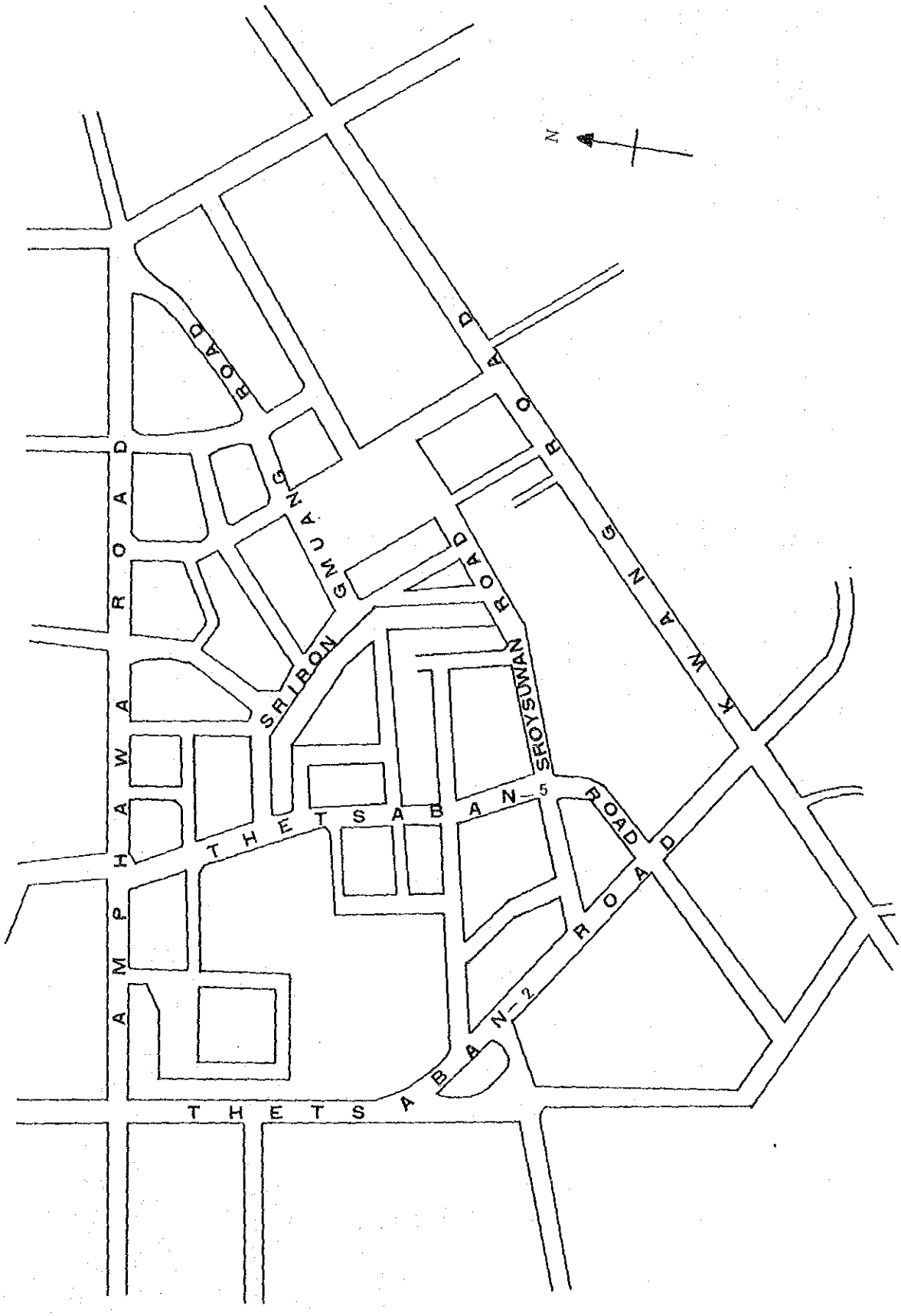
Table V Summary of Parasites in Liver Data

Area	Host	No. examined	Capillaria hepatica		Cysticercus fasciolaris	
			No. positive	% positive	No. positive	% positive
Chantaburi Municipality Zone I	Rattus norvegicus	40	32	80.0	19	47.5
	Rattus exulans	18	5	27.8	-	-
	Crocidura murina	3	-	-	-	-
		61	37	60.6	19	31.1
Tagad-Ngao Village No. 4	Rattus exulans	16	-	-	-	-
	Rattus rattus	1	-	-	-	-
		17	-	-	-	-
Chantaburi Municipality Zone III	Rattus norvegicus	24	24	100.0	11	45.8
	Rattus exulans	21	8	38.1	-	-
	Crocidura murina	9	-	-	-	-
		54	32	59.2	11	20.4
Ban Bo Village No. 5, 6	Rattus exulans	20	-	-	-	-
Chantaburi Municipality Zone IV	Rattus norvegicus	27	23	85.2	17	63.0
	Rattus exulans	38	17	44.7	5	13.2
	Crocidura murina	1	-	-	-	-
		66	40	60.6	22	33.3
Total		218	109	50.0	52	23.8

Table VI Summary of Isolation of Enteropathogenic Bacteria Data

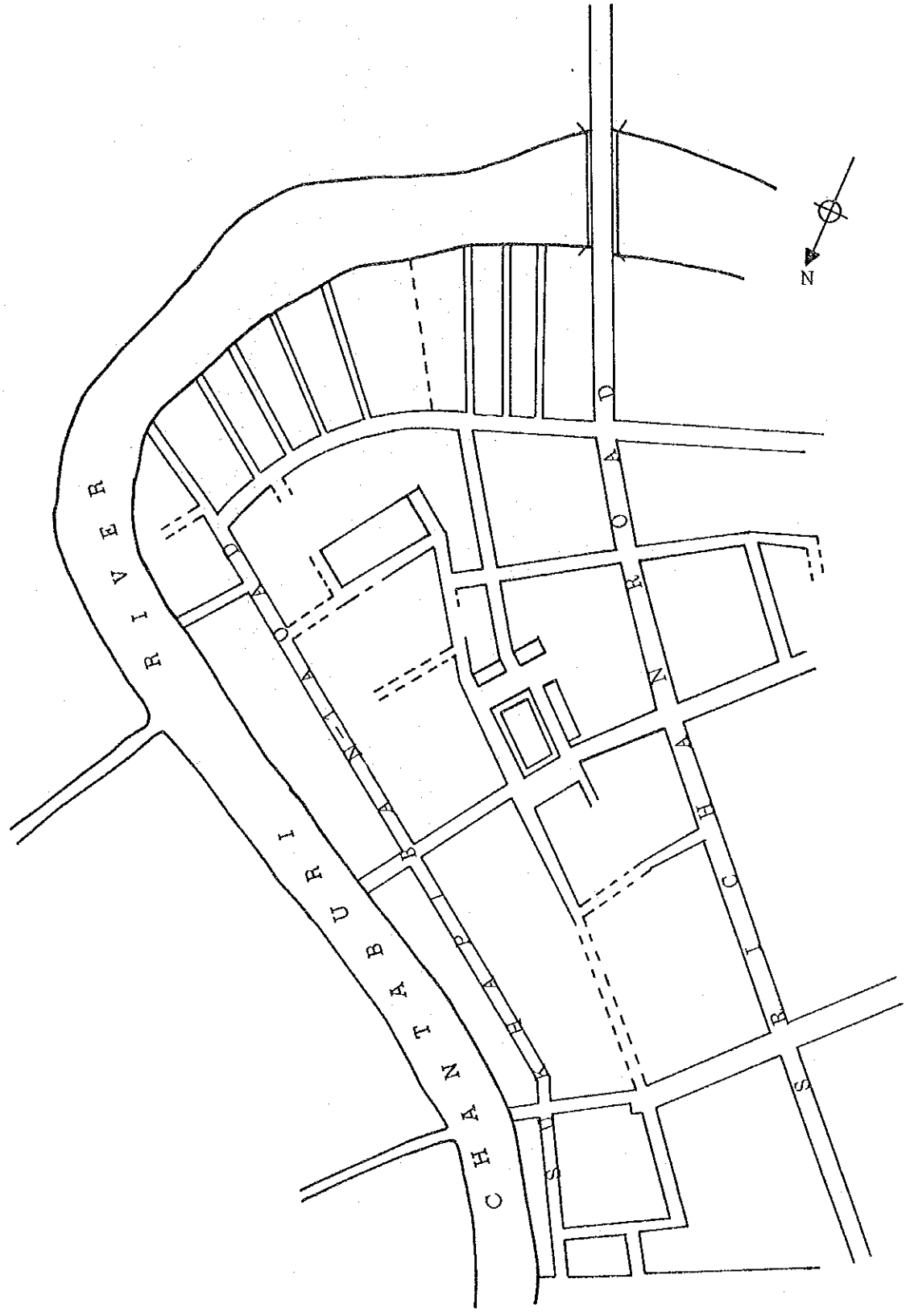
Area	Host	No. examined	No. positive	% positive	Salmonella spp.	Vibrio para-haemolyticus	Campylo-bacter spp.	Plesiomonas shigelloides
Chantaburi Municipality Zone I	Rattus norvegicus	24	10	41.7	3	2	2	3
	Rattus exulans	10	1	10.0	1	-	-	-
	Crocidura murina	1	1	100.0	-	-	-	1
		35	12	34.3	4	2	2	4
Tagad-Ngao Village No. 4	Rattus exulans	16	-	-	-	-	-	-
	Rattus rattus	1	-	-	-	-	-	-
		17	-	-	-	-	-	-
Ban Bo. Village No. 5, 6	Rattus exulans	7	-	-	-	-	-	-
Chantaburi Municipality Zone IV	Rattus norvegicus	18	7	38.9	4	1	-	3
	Rattus exulans	3	-	-	-	-	-	-
	Crocidura murina	1	1	100.0	1	-	-	1
		22	8	36.4	5	1	-	4
Total		81	20	24.7	9	3	2	8

MAP OF CHANTABURI MUNIPALITY
ZONE–1



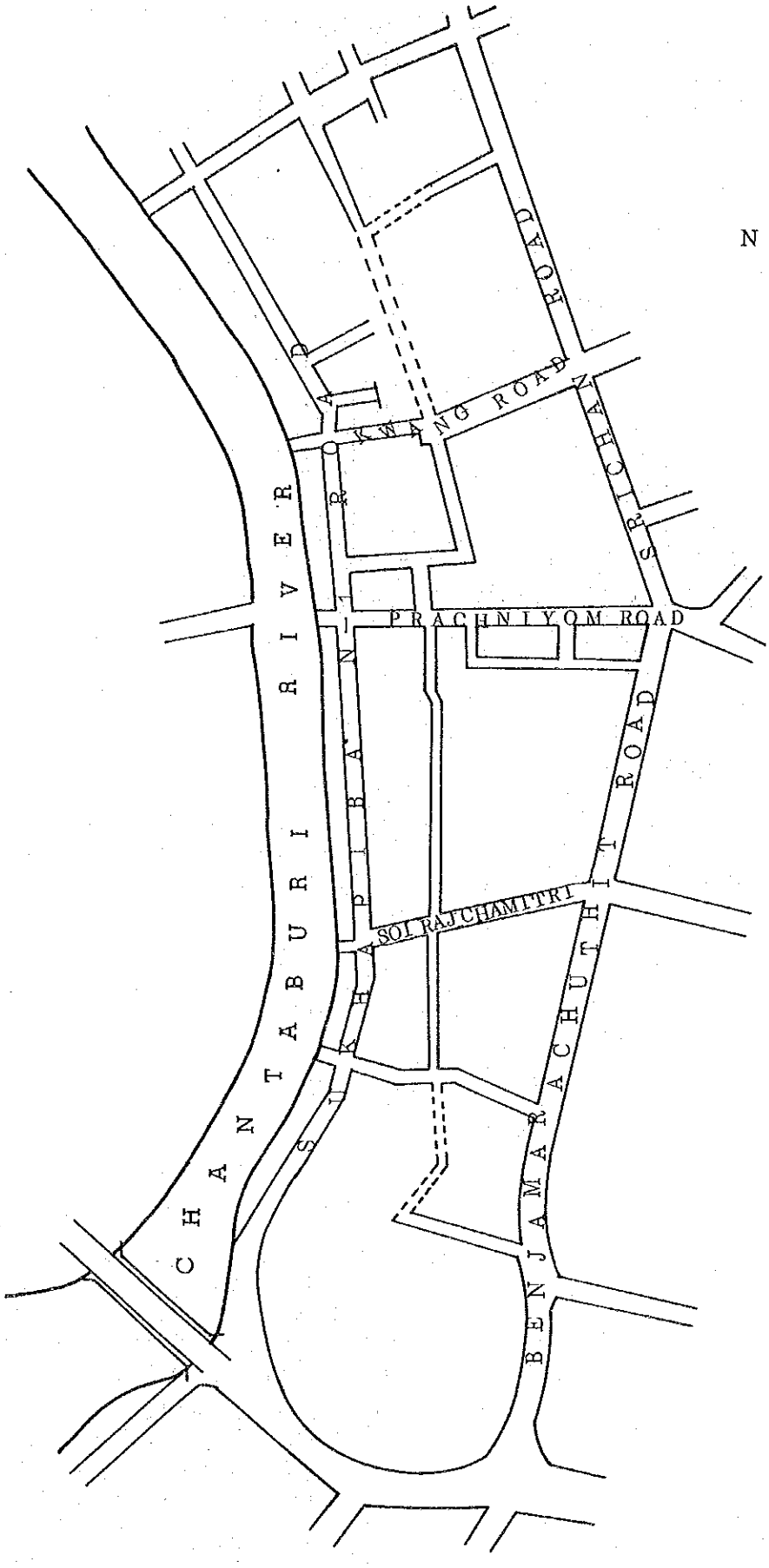
MAP OF CHANTABURI MUNICIPALITY

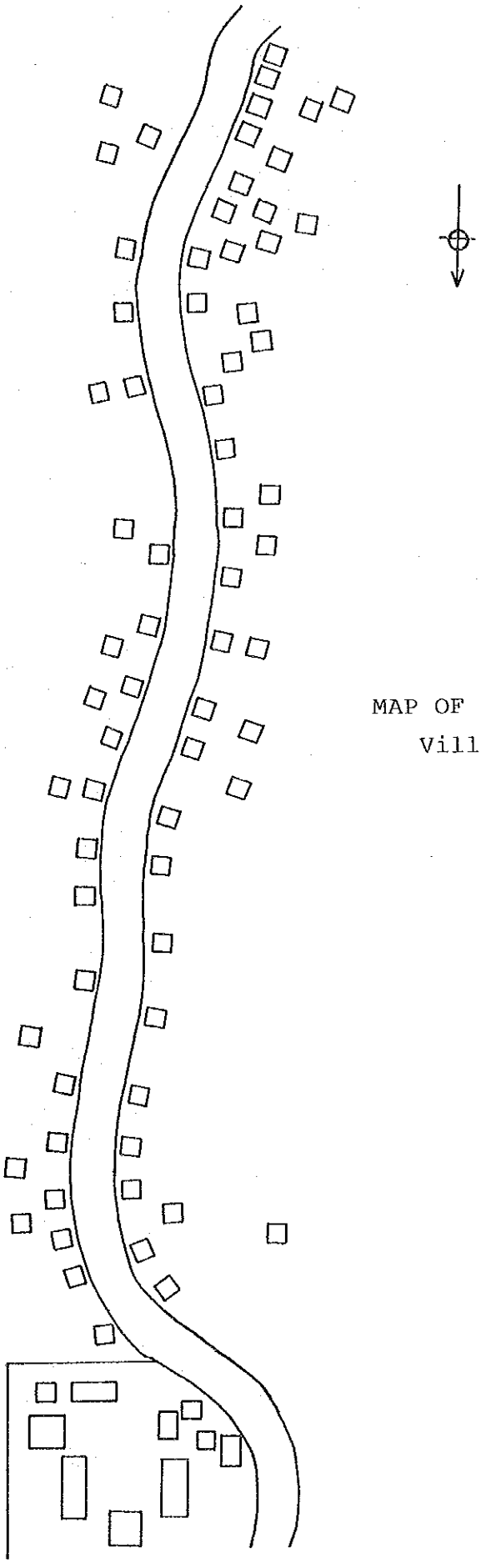
ZONE-3



MAP OF CHANTABURI MUNICIPALITY

ZONE-4



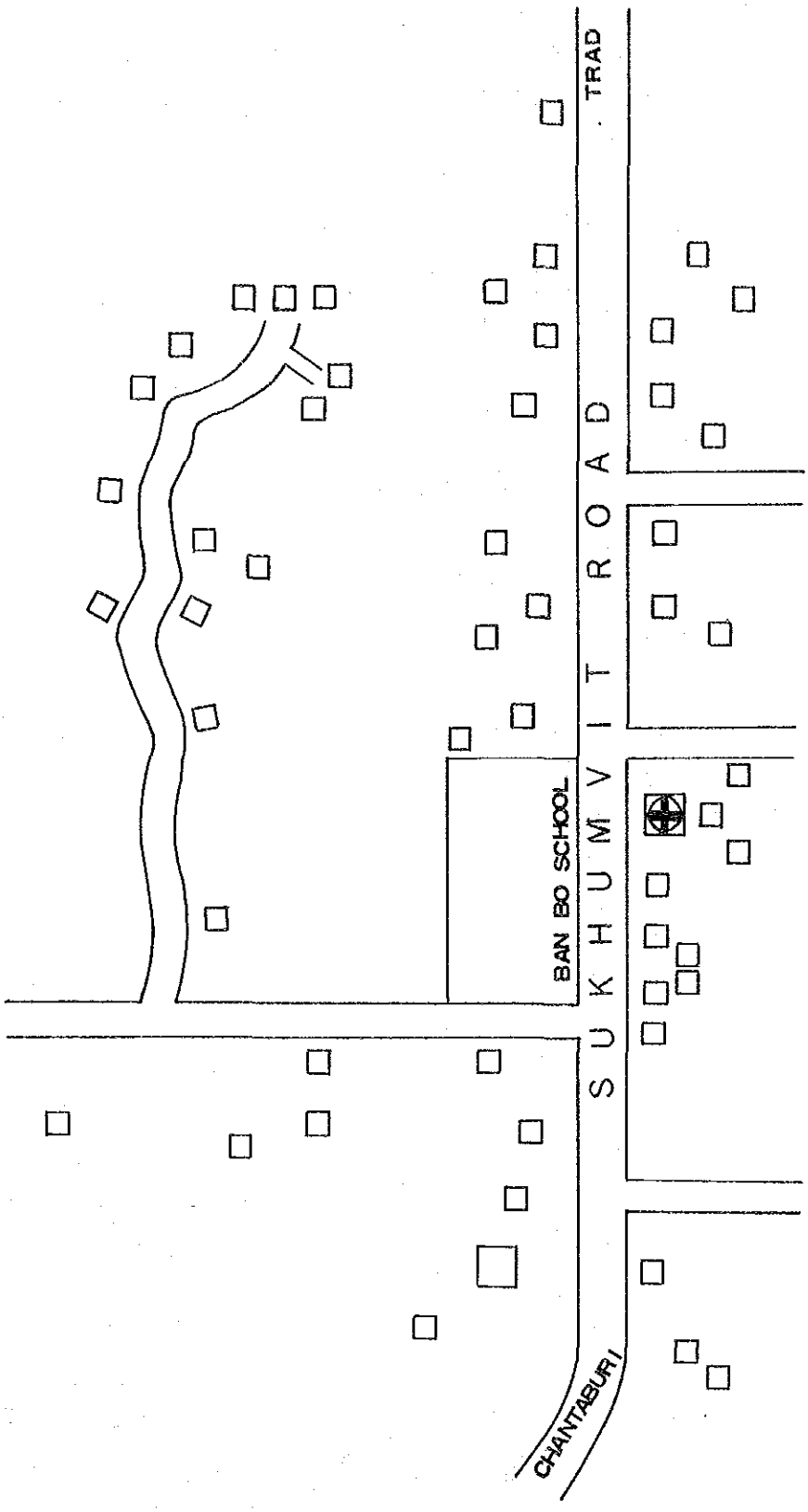


MAP OF TAGAD-NGAO

Village No.4

MAP OF BAN BO

Village No.5,6



2.5 DCP

1. One hundred and ninety one specimens are received from PHL Chanthaburi for typing as follows:-

a.	Salmonella	49
b.	E.coli	133
c.	Others	9

2. Supply of antisera and antigens to PHL Chanthaburi

a.	E.coli	21 ml.
b.	Shigella	6 ml.

In addition, during the months of October to December 1979, Division of Clinical Pathology received lungs and G-I tracts of the rats traped in Chanthaburi by Division of Medical Entomology for endoparasites of man examination. Details of results are given in the table 1 and 2.

Table 1 Angiostrongylus cantonensis found in the lungs

Date specimen received	No. examined	No. positive
Oct. 22, 1979	50	3
Dec. 3, 1979	77	13
Dec. 24, 1979	95	6
Total	222	22

Table 2 Endoparasites of man found in G-I tracts of the rats

Date specimen received	No. examined	H. nana	No. positive	
			H. diminuta	R. siriraji
Oct. 22, 1979	57	4	8	2
Dec. 3, 1979	78	4	7	12
Dec. 24, 1979	98	3	16	8
Total	233	11	31	22

* H. nana = Hymenolepis nana
H. diminuta = Hymenolepis diminuta
H. siriraji = Raillietina siriraji

2.6 Cholburi

Report of the laboratory activities of hospitals in Cholburi province during October - December 1979 are as follows:

1. Cholburi Hospital

	October	November	December
Bacteriology examination	3,479	2,984	3,080
Serology examination	537	519	1,119
Parasitological examination	5,262	5,358	5,326
Mycological examination	262	243	218
Haematological examination	8,592	8,809	8,992
Clinical chemistry examination	3,317	2,987	2,966
Spinal Fluid examination	324	192	312
Urine examination	4,860	5,816	4,996
Sanitation	55	42	18
Others (Media prep. etc.)	109,405	116,000	151,400 cc.

2. Panatnikhom District Hospital

	October	November	December
Blood fild for Malaria Parasites	470	434	400
Complete Blood Count	407	434	400
Blood Chemistry	113	152	79
Blood for VDRL	195	243	132
Blood for Serology test	58	53	42
Stool examination	58	89	61
Urine examination	1,367	1,246	1,447
Microbiology	77	106	110

3. Banglamung District Hospital

	October	November	December
Sputum Examination	19	7	15
Gram stain	114	116	89
Blood Film for Parasite	98	89	63
V.D.R.L.	87	156	127
Pregnancy test	42	43	44
Urine examination	127	275	412
Complete Blood Count	35	53	38
Hematocrit	36	40	16
Stool examination and culture	1	20	4

3. Activity III

During October - December 1979, the Activity was moving continuously in 3 Tambons: Tambon Bo, Amphore Klung; Tambon Tagad Ngao, Amphore Tamai and Tambon Saikao, Amphore Pongnamron.

4. Activity IV

No training activity was performed during this period.

5. Activity V

In December 1979, the Japanese team leader has started a new operation in Tambon Tung-Ben-Cha due to the monthly report showing the increasing rate of Gastroenteropathy in this tambon.

5.1 Analysis on Causative Agents of G.I. Diseases

5.1.1 Detection of Enterpathogenic Microorganisms from Diarrheal Patients in PHL, Chanthaburi between October - December 1979

Detection rate of V.parahaemolyticus was higher also in the period (October - December 1979) as reported in the previous progress reports and the second high was Shigella. V.cholerae was not detected.

Recently, so-called Group F Vibrio was detected frequently from cases showing cholera-like diarrhea in Bangladesh or others. Examination of this microorganism has been done from November 1979 in the PHL, Chanthaburi. As seen in Table, 2 cases in November, one case in December of this microorganism were detected. This must be one of the important causative agents for acute enteritis.

Results of bacteriological study on diarrheal cases
in the Provincial hospital and four district hospitals

	October	November	December
Number of rectal swab and stool	434	730	862
Isolated enteropathogenic organisms			
V. cholerae	0	0	0
So-called NAG Vibrio	2	2	0
So-called group F Vibrio	-	2	1
V. parahaemolyticus	51	45	53
Shigella	15	35	35
Salmonella	3	1	1
Enteropathogenic E. coli	24	22	17
Plesiomonas shigelloides	17	13	13

5.1.2 Isolation of enteropathogenic bacteria from school children in Tambon Tagad-Ngao

It was reported that some kind of enteropathogens were isolated from seemingly health school children in field tambons in Chanthaburi province. In the study performed last year, rather homogenous spread of bacillary dysentery over the province (0.5% of school children showed Shigella infection in any different tambons) and V.parahaemolyticus infection was seen in tambons near sea shore more often than mountainous area.

In this year the same study was repeated in Tambon Tagad-Ngao. Parasitological examination was done on the same subjects as in this study.

Method of examination was the same as reported previously.

The present study showed more incidence of enteropathogen infection in general among school children in Tambon Tagad-Ngao than in the last study. But, Shigella infection was seen in only one child (0.25%). Salmonella infection was seen in 21 cases (4.4%), V.parahaemolyticus 38 (7.9%) and P.shigelloides 12 (2.9%). All school children were seemingly healthy. However, inquiry tells that about 40% of children had episode of diarrhea days prior to the examination.

Enteropathogen infection is presumed to occur repeatedly among villagers. This sort of study will tell only one dimension of repeating infections. Therefore, we are expecting that school teachers will be able to do health education to pupils by using their own results.

Isolation of enterpathogenic bacteria from school children at Tambon Tagad-Ngao

School	No. of specimens	No. of positive	Shigella	Salmonella	V.parahae-molyticus	P.shigel-loides
1	100	14(14.0%)	-	10*	3	2
2	95	16(16.8%)	1	3	11**	2
3	85	15(17.6%)	-	5***	10	1
4	100	16(16.0%)	-	3	12	1
5	100	7(7.0%)	-	-	2**	6
Total	480	68(14.2%)	1(0.25)	21(4.4%)	38(7.9%)	12(2.9%)

* Two organisms, Salmonella and P.shigelloides, were isolated from a individual

** Two organisms, V.parahaemolyticus and P.shigelloides, were isolated from a individual

*** Two organisms, Salmonella and V.parahaemolyticus, were isolated from a individual

5.1.3 Examination on enteropathogens of fecal specimens obtained from food handlers and their families in Chanthaburi province

Bacteriological examination of fecal specimens taken from food-handlers and their families was taken place in Tambon Saikao. Method of examination adopted here was the same as reported previously in the Quarterly Progress Report.

Enteropathogens were detected in 10 (33.3%) among 30 cases examined. Two cases of Shigella, one case of Salmonella, two Vibrio parahaemolyticus and five P.shigelloides were detected.

It is dangerous that personnels whose fecal specimens reveal some kind of enteropathogens work in food shop because of possibility of secondary infection through sold food. Annual bacteriological examination of food handlers and their families will be carries out from now on and Shigella and Salmonellatyphi positive cases must be adequately treated. Compulsory restriction of their working is desirable until they are proven to be pathogen free.

Results of Enteropathogenic Bacteria among Persons of the Food Shop at Tambon Saikao

Age group	No. of specimens	No. of positive	Shigella	Salmonella	V.parahae-molyticus	P.shige-lloides
1 - 4 years	2	1	-	-	-	1
5 -14 years	7	1	-	-	1	-
15 -64 years	21	8	2	1	1	4
Total	30	10(33.3%)	2	1	2	5

5.1.4 Bacteriological examination of drinking water in Tambon Saikao

Bacteriological examination of drinking water in one of the project's field tambons, Tambon Saikao was done in a serial survey. This area is rather mountainous. It is sometimes difficult to obtain good well water there so that they use not only rain water but also river and pond water. In villages 1 and 3 simplified water supply is partly available which is led by a head between dam level in a river and village level.

However, coliform bacilli were detected from tap water of simplified water supply system in all (two) cases. In all 4 cases of well water, coliform was positive and in one case P.shigelloides was positive.

As can be imagined easily, coliform and P.shigelloides were detected from river and pond water.

In this area incidence of diarrheal cases was rather high according to the report from village volunteers. The high detection rate of bacterial contamination may be one of reasons of this high incidence of diarrheal patients. In an area where people utilize river and pond as a source of drinking water, there may be increasing danger of occurrence of mass out-break of intestinal infection. Utilization of rain and good well in this area will be desirable.

Results of bacteriological examination in drinking water at Tambon Saikao

Place	No. of sample	Total count/ml.				Coliform count/ml.			Enter-opathogenic organisms
		<10	10-100	100-1,000	>1,000	<10	10-100	100-1,000	
Water supply	2		1	1		1	1		-
Well water (Public)	4		1	3		3	1		P.shigell-oides (1)
River water for drinking	2		1	1		2			P.shigell-oides (1)
Pond water for drink-ing	1			1		1			P.shigell-oides (1)

5.1.5 Detection of Compylobacter fetus from Diarrheal patients

Bacteriological examination of fecal specimens taken from diarrheal patients who visited or were admitted to the Prapokklao Hospital and four district hospitals revealed 30% positive of known pathogens, such as Shigella, Salmonella, Vibrio parahaemolyticus, so-called NAG Vibrio, P.shigelloides, enteropathogenic E.coli. However, etiological agent of the rest of cases (70%) remains unknown.

Efforts have been, however, made in order to clarify etiological agents in diarrheal cases of unknown cause.

Recently, Campylobacter fetus subsp. Jujuni has been recognized to be one of the causative agents of acute diarrhea in Europe, U.S.A., Australia or in Japan. Examination of this microorganism has been made also in PHL, Chanthaburi.

As shown in Table, 3 cases (5.1%) among 59 diarrheal cases revealed the microorganism. All three cases were diarrheal patients with high fever.

It becomes apparent that Campylobacter fetus can be detected as an etiological agent of diarrheal diseases also in Thailand. This examination should be added to the routine procedure from now on.

Detection of Campylobacter fetus from diarrheal cases in Chanthaburi

Date	Age group	No. of specimens	No. of positive
Aug., 1979	- 3 years	38	1
Sep., 1979	27 days	3	-
	1 - 11 months	7	-
	1 - 4 years	2	-
	5 - 14 years	6	2
	15 - years	3	0
Total		59	3 (5.1%)

5.1.6 Diarrhea Caused by Enterotoxigenic E.coli

E.coli which causes enteritis is divided in to three categories:

1. Enteropathogenic Escherichia coli
2. Enterotoxigenic Escherichia coli
3. Enteroinvasive Escherichia coli

In PHL, Chanthaburi No. 1 has been examined as a routine work, which has been detected from 3% of diarrheal cases. As for No. 2, high-graded technique like animal experiment or tissue culture is required and this cannot be done as a routine examination in the present PHL. E.coli isolated from diarrheal patients, therefore, has been sent to the Metropolitan Research Laboratory for Public Health, Tokyo for the examination. So far, enterotoxigenic E.coli was detected from 5 cases (5.6%) in 89 examinations. Two of 5 cases were heat-stable enterotoxin producing E.coli and 3 were both heat-stable and heat-labile enterotoxin producing E.coli. These findings show that there must be good number of enterotoxigenic E.coli as a causative agent of acute diarrhea seen in Chanthaburi province.

As for No. 3, or enteroinvasive E.coli, diagnostic sera was given from the Metropolitan Research Laboratory for Public Health, Tokyo. Examination of this species has been done as a routine one from December 1979.

Enterotoxin Productivity of E.coli Isolated from Diarrhea cases*

Age group	No. of specimens	No. of positive	Enterotoxin production		
			LT	ST	LT&ST
Under 3 years	65	3 (4.6)		2	1
4 - 18 years	2	0			
Over 19 year	22	2 (9.1)			2

* Toxin producibility was examined at the Department of Microbiology, Tokyo Metropolitan Research Laboratory of Public Health, Japan.

5.1.7 Survey on the parasitic infestation in Chanthaburi Province

A laboratory for medical zoology and an office of epidemiological surveillance have been opened in the provincial public health office since October 1979. In the laboratory, parasitological examination can also be done. In this study, stool specimens collected from various places were transferred to the laboratory and fixed by 10% formalin and concentrated by centrifugation by using antiformin and ether. Microscopic examination on ova of parasitic worms were made by Japanese Expert for Medical Zoology, M. Hasegawa with collaboration of Thai scientists.

Parasite-positive cases were immediately given a single dose of Combantrin^{R} (pyrantel pamoate) for the treatment. The same study will be done to follow the effect of the treatment and of health education given by school teachers.

a. School children in Tambon Saikao

Stool specimens were collected from 329 school children of 5 primary schools and 47 other children. (Table 1 and 2) Hookworm showed 38.3% of the parasitic rate in school children. This parasitic infestation is one of the most serious problems in this Tambon. Other parasitic worms were found as follows: Strongyooises stercolaris 8 (2.4%); Enterobius vermicularis 2; Trichostrongylus orientalis 4; Trichuria trichuura 1; Ascaris lumhricoides 1 and Fasciola hepatica 1.

Table 1 Results of the survey on parasitic helminths in Tambon Saikao

Group of examined individuals	Number examined			Number of positive for parasitic worms			
	M	F	Total	M	F	Total	%
Children under school age	13	8	21	1	0	1	4.8
School children	183	146	329	86	66	154	46.8
Over school age individuals	15	11	26	4	3	7	43.7
Total	211	165	376*	91	69	163	43.3

* Excluding the individuals not clear of their ages.

Table 2 Species of parasites found in school of school children in Tambon Saikao

Species of parasites	Cases found	%
Strongyloides stercolaris	14	4.2
Enterobius vermicularis	2	
Trichostrongylus orientalis	6	
Hook worm	126	38.3
Trichuris trichiura	3	
Ascaris lumbricoides	2	
Fasciola heaptica	1	
Total	160	48.6

b. Food handlers and their families in Tambon Bo

Two hundred seventy-seven fecal specimens from personnel of food shops and their families in Tambon Bo were examined for parasitic infestation. Six specimens of parasites were recorded. Among them hookworm was positive in 17.7% of specimens tested. This rate was found higher in food handlers than in their families. Other species found as follows. Strongyloides stercolaris 5 (1.8%). Enterobius vermicularis 2; Trichostrongylus orientalis 5 (1.8%). Ascaris lumbricoides 1 and Taenidae sp. 1. (Table 3)

Table 3 Results of survey on parasitic infestation in food handlers and their families in Tambon Bo

Sex	Age group	No. of examined		No. of positive for parasites					
				Ss	Ev	To	HW(%)	Al	Tae
Male	Under 15 Families	72	127		1	1	10 (13.9)		
	Over 16 Food-handler	55				1	11 (20.0)		
Female	Under 15 Families	65	150	1	1	1	9 (13.8)		1
	Over 16 Food-handler	85		4		2	19 (22.3)	1	
Total			277	5	2	5	49 (17.7)	1	1

Remarks: Ss = Strongyloides stercolaris
Ev = Enterobius vermicularis
To = Trichostrongylus orientalis
HW = Hookworm
Al = Ascaris lumbricoides
Tae = Taenidae SP.

c. Pin-worm infestation in school children in Tambon Bo and Tambon Tagad-Ngao

Three hundred ninety-eight children in Tambon Bo and 479 children in Tambon Tagad-Ngao were examined for pinworm infestation by scotch tape method. Individuals carrying this parasite in one examination were 27.4% in Tambon Bo and 39.2% in Tambon Tagad-Ngao. (Table 4 and 5)

The infestation rate was higher in school children than those under school age.

Table 4 Incidence of pin-worm infestation in children in Tambon Bo

Age	Male			Female			Remarks
	Number of examined	Number of positive	%	Number of examined	Number of positive	%	
1	20	1		17	1		
2	19	1		27	6		Under school aged
3	13	2	10.3	9	5	23.6	
4	20	3		15	1		
5	15	3		21	8		
6	13	2		26	7		
7	25	4		32	11		
8	50	20		65	30		
9	4	2	31.9	3	1	38.3	School children
10	1	1					
11							
12	1	1					
Total	181	39	21.5	217	70	32.3	

Table 5 Pin-worm infestation in children in Tambon Tagad-Ngao

Age	Male			Female			
	Number of examined	Number of positive	%	Number of examined	Number of positive	%	
1	17	6		12	2		
2	17	1		4	1		
3	7	2	19.7	11	3	19.0	
4	17	3		21	3		
5	13	2		10	2		
6	14	6		7	3		
7	78	31		75	36		
8	49	27		46	20		
9	11	9	45.7	17	10	47.6	
10	15	6		8	3		
11	13	5		10	6		
12	4			3	1		
Total	255	98	38.4	224	90	40.1	

5.2 Research on Community Participation in Health Promotion

In 1979, village volunteer communicators were appointed in only two villages in each field tambon. Total number of communicators were 53. They have been trained and asked to report birth and death of people (every two weeks), diarrheal and febrile patient (everyday) to the health centre.

The population of villages were they are working is as follows;

Saikao	Village 2	Population	729	Volunteer	10
	Village 8	"	388	"	10
Tagad-Ngao	Village 4	"	562	"	7
	Village 6	"	554	"	9
Bo	Village 7	"	373	"	7
	Village 9	"	509	"	9

In October 1979, reported number of febrile and diarrheal cases from May to September 1979 by volunteer communicators was examined. Results are shown in Table 1 and 2. Total reported number of febrile cases in 5 months in Saikao was 325 while in Tagad-Ngao 34 and Bo 151. Number of diarrheal cases reported in 5 months in Saikao was 238 while in Tagad-Ngao 13 and Bo 26. It can be presumed that there are some differences of incidence of diseases in each tambon. However, judging from these data, activity of volunteer communicators is more likely to be different in each village. According to the results published in this progress report concerning intestinal infection, incidence of diarrhea in Tambon Saikao is not markedly higher than other two tambons. Volunteer communicators, therefore, seem to have done their duty in Saikao better than in other two tambons. Later on activity of volunteers shall be searched in each village to clarify the cause of this difference of activities. And thus, investigation of variety on function of volunteer would give us a key to solve difficult problems involved in community participation in health promotion.

Table 1

Report of Volunteer Communicators on Febrile Cases

May - September, 1979

Volunteer	Saikao Village 2	Tagad-Ngao Village 4	Bo Village 7
A	11	0	2
B	22	1	2
C	3	0	12
D	4	1	55
E	29	0	10
F	26	1	4
G	1	4	14
H	4	/	/
I	20	/	/
J	12	/	/
Total	132	7	99
	Village 8	Village 6	Village 9
A	5	1	9
B	17	3	5
C	60	5	2
D	9	0	5
E	33	5	3
F	33	3	0
G	21	4	13
H	2	1	14
I	1	5	1
J	12	/	/
Total	193	27	52

Table 2

Report of Volunteer Communicators on Diarrheal Cases

May - September, 1979

Volunteer	Saikao Village 2	Tagad-Ngao Village 4	Bo Village 7
A	9	0	1
B	15	2	0
C	5	2	0
D	9	1	2
E	14	2	3
F	4	0	0
G	4	0	0
H	9	/	/
I	8	/	/
J	7	/	/
Total	84	5	9
	Village 8	Village 6	Village 9
A	2	0	0
B	4	0	3
C	37	0	0
D	7	0	1
E	23	7	1
F	35	0	0
G	26	0	4
H	7	0	6
I	7	1	2
J	6	/	/
Total	154	8	17

5.3 Research on HBs Antigen and Antibody

In order to study incidence of hepatitis virus infection in Chanthaburi province, total 310 serum specimens were collected from admitted patients in the Prapokklao Hospital, Chanthaburi, Thailand. Serum samples were collected from different age groups (Table) regardless of diseases of patients. Serum specimens were kept frozen and transferred to Tokyo Metropolitan Research Institute of Medical Science. Assay was done by Surapee Srisupaluck who was sent there as a project training participant. This study will be published in a journal in due time.

HBs antigen and antibody and HBc antibody were determined by reversed passive hemagglutination and passive hemagglutination method. HA antibody was done by radioimmunoassay.

Results

As seen in Table 1. HBs antigen positive rate was almost evenly distributed in each age group except for 25 - 34 age group whose positive rate (20 - 25%) was markedly higher than other age groups. HBs antibody positive rate was low in 0 - 4 age group and increased by age up to 66.67% in 20 - 24 age group. In older age group over 25 years the rate decreased more or less. In case of HBc antigen positive case, the rate increased gradually up to about 70% in age group older than 30.

Table 2 shows HA antibody positive rate in different age group. The lowest rate was seen in 0 - 4 age group and the rate increased up to 100% in age group 40 - 44.

Conclusion

Incidence pattern of hepatitis infection in each age group of people in Chanthaburi shows earlier occasion of infection in their lives than seen in the northern countries like Japan or U.S.A. This may indicate more frequent opportunity of contamination of hepatitis virus among people here. As for hepatitis A, a preventive measure would be able to be taken in the same way as intestinal infection.

Table 1

Age Distribution of HBs Ag, HBs Ab and HBc in patients admitted to Prapokklao Hospital, Chanthaburi

	No. tested	HBs Ag(+)		HBs AB(+)		HBc Ab(+)	
		No.	%	No.	%	No.	%
Total	310	25	8.06	96	30.97	133	42.9
Male	155	16	10.32	48	30.97		
Female	155	9	5.81	48	30.97		
0 - 4	44	2	4.6	3	6.82	3	6.8
5 - 9	47	1	2.1	9	19.2	11	23.4
10 - 14	49	4	8.2	8	16.3	16	32.7
15 - 19	49	4	10.3	11	28.21	23	59.0
20 - 24	24	1	4.2	16	66.7	14	58.3
25 - 29	20	5	25.0	9	45.0	12	60.0
30 - 34	10	2	20.0	4	40.0	7	70.0
35 - 39	11	1	9.1	3	27.3	5	45.5
40 - 44	13	2	15.4	6	46.2	7	53.8
45 - 49	11	2	16.2	3	27.3	7	63.6
50 - 79	41	1	2.4	23	56.1	28	68.3

Table 2

Age distribution of HA·Ab in Patients admitted to Prapokklao Hospital, Chanthaburi

	No. tested	H.Ab(+) No.	H.Ab(+) %
Total	310	211	68.06
0 - 4	44	7	15.9
5 - 9	47	23	48.9
10 - 14	50	35	70.0
15 - 19	39	29	74.4
20 - 24	24	20	83.3
25 - 29	20	19	95.0
30 - 34	10	9	90.0
35 - 39	11	10	90.9
40 - 44	13	13	100.0
45 - 49	11	9	81.8
50 - 79	41	37	90.2

December 28, 1979

Soichi Kumaoka

Soichi Kumaoka, M. D.
Japanese Expert Team Leader

Sutas Guptarak

Sutas Guptarak, M. D.
Project Director

Progress Report No. I

Project: Promotion of Provincial Health Services

January - March 1980

There are some satisfactory progresses in all Activities, especially the studies on causative agents of gastrointestinal diseases and community participation in health promotion, which useful results and data obtained will pave the way for improvement of the country's health condition in the near future.

1. Expert

1.1 Dr. Akira Igarashi, expert on Virology, coming on January 25th, 1980 to 25 February 1980.

1.2 Dr. Kazuo Yasutomi, expert on Entomology, during 3 - 23 March 1980.

1.3 Mr. Toshio Hida, Coordinator, left on 23 March 1980 as the term is ended and Mr. Masao Watanabe, a new Coordinator, arrived on 13 March 1980.

1.4 JICA Repairing Team has come for the purpose of checking and repairing the medical equipment provided by the Government of Japan for the medical cooperation projects during 28 - 29 February 1980. The members are as follows:-

1.	Mr. Yoshimasa Sakaguchi	Shimazu Seisokusho Co., Ltd.
2.	Mr. Yoshimitsu Sugino	Toshiba Medical Co., Ltd.
3.	Mr. Masakazu Hayashi	Tomii Seiko Co., Ltd.
4.	Miss Yoko Kishino	JICA

3. Fellowship

3.1 Dr. Suwat Sermpanichkit, Director of Tamai District Hospital, short term fellowship in Epidemiology, left for Japan on 20th March 1980.

3.2 Dr. Tawin Klinvimol, Director of Pong Nam Ron District Hospital, short term fellowship in Epidemiology, left for Japan on 20th March 1980.

3.3 Dr. Danai Danvivatthana, Head of Department of preventive and social medicine, Prapokklao Hospital, fellowship in Preventive Medicine, left on 20th March 1980.

3. Project's Activity

3.1 Activity I

3.1.1 Strengthening of the PHL as a clinical diagnostic laboratory

1. Clinical chemistry

Two lots of known lyophilized sera were continued to use for study and running of quality control in clinical chemistry. The results of analyses during the three-month-period (Jan. - March 1980) are as follows:

	Consera (C 2)				C 1 (Abnormal)				Tonks
	N	Mean	S.D	*CV(%)	N	Mean	S.D	*CV(%)	C.V(%)
Glucose	62	121.56	6.53	5.37	64	210.54	10.4	4.94	10.0
Cholesterol	64	166.92	12.00	7.19	64	240.27	17.74	7.38	10.0
T. Protein	64	6.51	0.54	8.29	64	6.44	8.35	8.38	7.1
Albumin	64	3.86	0.76	19.69	64	4.03	0.54	13.40	6.2
Na	63	131.23	2.10	1.60	64	147.55	2.35	1.59	2.2
K	63	4.39	0.22	5.01	64	5.53	0.12	2.17	8.0
Cl	63	96.65	2.90	3.00	64	97.33	3.39	3.48	2.0
A.L.P.	64	21.27	5.37	25.25	64	38.85	6.38	16.42	10.0
G.O.T.	64	14.19	4.21	29.67	64	43.39	9.90	22.82	10.0
G.P.T.	63	9.74	4.95	50.92	63	41.55	11.83	28.47	10.0
T. Bilirubin	62	0.46	0.14	30.43	63	1.35	0.22	16.30	10.0
B.U.N.	64	18.03	2.41	13.37	64	68.10	7.23	10.61	10.0
Creatinine	64	0.96	0.13	13.54	64	3.78	0.40	10.58	10.0
Uric acid	31	4.38	0.36	8.24	39	8.36	0.72	8.6	10.0

* Since all tests were performed during the routine conditions, therefore the CV is actually a RCV.

2. Clinical Hematology

a. Number of white blood cell count, automated method: 4940

b. Number of red blood cell count, automated method : 21

c. Number of platelet count, phase-contrast method : 482

d. Number of test, prothrombin time : 56

3. Clinical microbiology and blood banking: No further progress

4. Virology

a. Detection of HBs Ag and Anti HBs

Sera from blood donors and symptomatic patients were examined for HBs Ag and Anti HBs during the three-month-period. The results are as follows:

	Types of Specimen	No. of Specimen examined	Positive for Hbs Ag		Positive for Anti HBs	
			No. of Specimen	Percentage	No. of Specimen	Percentage
1	Blood Donors	773	70	9.06	363	46.96
2	Patients	27	7	25.93	8	29.63

b. Serodiagnosis of Dengue and DHF suspected patients

Twenty (20) cases of recent dengue infection were detected among twenty-nine (29) cases examined.

3.1.2 Strengthening of the PHL as a public health laboratory

1. Examination of feces for surveillance of diarrheal diseases,
   a. Number of specimen from PCMO : 894
      Number of positive cases for enteropathogens: 127
   b. Number of specimen from Prapokklao Hospital : 2,199
      Number of positive cases for enteropathogens: 505
2. Bacteriologic examination of food and water
   a. Food : Number of specimen : 47
   b. Water: Number of specimen : 105

3.1.3 Strengthening of the SRL in the three districts hospital and one district health and medical center

The laboratory activities of four SRLs during the period of three months are listed as follows:

1. Tamai District Hospital
   A. MICROBIOLOGY
      - Blood parasitology - Malaria = 811
   B. HAEMATOLOGY
      - Haematocrit = 190
      - WBC count = 190
      - Diff. count = 190
      - Preg. test = 2

C. URINE ANALYSIS = 139

2. Klung District Hospital

A. MICROBIOLOGY

- Gram stain - G.C. = 2
- AF stain - TB = 12
- Blood parasitology - Malaria = 700
- Stool parasitology - Protozoa: Helminths = 21

B. HAEMATOLOGY

- Haematocrit = 135
- Haemoglobin = 277
- WBC count = 270
- Diff. count = 247
- Blood group = 380
- R.P.R. = 93

C. URINE ANALYSIS = 360

3. Laemsingha District Hospital

A. MICROBIOLOGY

- Gram stain - G.C. = 1
- AF stain - TB = 7
- Wet preparation - Fungi = 4
- Blood parasitology - Malaria = 403
- Stool parasitology - Protozoa: Helminths = 20

B. HAEMATOLOGY

- Haematocrit = 121
- Haemoglobin = 118
- WBC count = 126
- Diff. count = 127

Others

- FBS = 12
- Rectal swab. = 111

C. URINE ANALYSIS = 119

4. Phong Num-ron District Health and Medical Center

A. MICROBIOLOGY

- Gram stain - Pathogens = 2
- Gram stain - G.C. = 2
- AF stain - TB = 1
- Blood parasitology - Malaria = 533

B. HAEMATOLOGY

C. URINE ANALYSIS = 33

3.2 Activity II

3.2.1 DPHLS

1. Chemical reagents, bacteriological media and antisera have been supplied regularly by DPHLS to PHL Chanthaburi during January 1980 to March 1980.

2. Oscilloscope, Model SS-5100, completed with standard accessories was supplied by JICA to DPHLS.

3.2.2 DFA

1. Analysis results of food samples collected from Chanthaburi during 4 - 6 February 1980 are as follows:-

a. Microbiological examination: From 17 samples examined, Clostridium welchii were found in a dried shrimp sample and in 3 kinds of Thai sweet.

Ice and drinking water in sealed bottles were also checked. Products that are manufactured in Chanthaburi were collected at the plant. Eight from thirteen samples did not meet the microbiological standard as a drinking water.

b. Food standard: Three samples of beverage (concentrated syrup), 3 samples of coffee bean powder, 2 food colors and 3 samples of fish sauce were collected from processing areas in Chanthaburi. All of 3 beverage samples did not comply to its standard because of high level of benzoic acid and contaminated by yeast and mold. One sample of fish sauce also did not meet the standard by low specific gravity and low sodium chloride content.

c. Food additives: Non permitted color, crocine scarlet 3 B, was detected in 5 out of 8 colored food samples. High level of benzoic acid was found in one sample of dried tamarind.

d. Chemical contaminants: From 24 samples of fish analyzed for mercury content, only one sample of sweetened dried fish contained 0.66 ppm of Hg which over the safety limit.

Nine samples of dried food, peanut and its products were checked for contamination of aflatoxin. One sample of ground peanut contained aflatoxin over the safety level, 20 ppb.

2. Research work

Under the supervision of Dr. M. Toyoda, determination of histamine was carried out in 24 samples of seafood taken from Chanthaburi. Histamine was detected in all samples in the range of 77 - 1318 ppm.

3.2.3 VRI

Production and standardization of arbovirus reagents

a. Production of antigens during January - March 1980

Den-2	SAPr	antigen	0.5 ml. x 154 amps.
Chik	SAPr	antigen	0.5 ml. x 19 amps.
Chik	SA	antigen	0.5 ml. x 79 amps.

b. Production of reference antisera

Immune sera

Antisera to Dengue type 4 was prepared in two monkeys (Maccaca nemestrina) by 0.5 ml. subcutaneous and intravenous injection of 10^3 ti 10^4 plaque forming units (pfu). Serum was harvested one month after inoculation and every 2 weeks after the first bleeding. The standardization of antisera was undertaken.

3.2.4 DME

1. Entomological study of arbovirus Chanthaburi

Aedes aegypti control was carried out in Chanthaburi municipality and Channimit sanitation. Four thousands and eighty three houses were applied with malathion ULV and 2397 houses received Abate treatment. The mosquito densities were monitored and the results were as follows:

Aedes aegypti densities in Chanthaburi municipality

Landing collection

Date 1980	12/2	Abate application 14-20/2		Malathion application 22-27/2	24/3	21/4
Female	2.7		-		0.5	0.7
Male	1.8		-		1.1	1.1
Total	4.5		-		1.6	1.8

Larval survey

Date 1980	12/2	Abate application 14-20/2	21/2	Malathion application 22-27/2	24/3	21/4
House Index	35/6		20.8		22.0	22.4
Container Index	11.7		6.4		7.2	7.5
Breteau Index	71.9		44.8		35.3	33.6

2. Urban rodent study

The study and survey on carrying of enteropathogens by rodents has been carried out in Chanthaburi province from the standpoint of medical zoology, parasitology and bacteriology, by the Division of Entomology, Department of Medical Sciences and Japanese expert, Dr. M. Hasegawa.

All polynesian rats captured in Tamai and Klung districts were pathogen free. On the contrary, the rats captured in municipal area various pathogens were detected. From 63 Norwegian rats captured from the markets in central part of Chanthaburi, 9 cases of Salmonella, 5 cases of V.parahaemolyticus and NAG Vibrio 3 cases were found. In 6 house shrews two or three kinds of pathogens were detected from all of these animals.

In Tambon Chantanimid, Muang district, Salmonella and V.parahaemolyticus were detected from Norwegian rats while Salmonella, V.parahaemolyticus and NAG Vibrio were also detected from all house shrews captured in the same place.

As for polynesian rats carrying rate of pathogens were extremely low, only one rat was detected. (Table 1)

Serotype of 21 Salmonella isolated from rats and allied small animals were shown in the Table 2. All 11 strains of V.parahaemolyticus were Kanagawa-hemolysin non-producing.

From the findings it can be concluded that various pathogens including Salmonella and others were carried by rats captured from the crowded places such as central part of Chanthaburi. Marked difference in carrying rate of pathogens by each species of rats was recognized. Polynesian rat carries much less intestinal pathogens than Norwegian rat or house shrew.

Table 1

Isolation of Interopathogenic Bacteria from Rat

Place caught	Species of rat	No. of rat examined	No. of pathogen-positive rat	Salmonella	V. para-haemolyticus	NAG Vibrio	P. shige-lloides
Village No. 4 Tagad Ngao, Tamai	Polynesian rat (Rattus exulans)	9	0				
Village No. 1 Toongbencha, Tamai	Polynesian rat (Rattus exulans)	7	0				
	Unknown	3	0				
Village No. 5 & 6 Bo, Klung	Polynesian rat (Rattus exulans)	7	0				
Central part, Chanthaburi	Norway rat (Rattus norvegicus)	63	27	9	5	3	14
	Polynesian rat (Rattus exulans)	18	3	1	-	-	2
	House shrew (Crocidura murina)	6	6	4	2	-	4
Village No. 2, 3, 4 Chantanimit, Muang	Norway rat (Rattus norvegicus)	12	7	5	2	-	-
	Polynesian rat (Rattus exulans)	10	1	-	1	-	-
	House shrew (Crocidura murina)	3	3	2	1	2	-

Table 2

Serotypes of Salmonella Isolated from rats

S. weltevreden	9
S. typhi-murium	2
S. virchow	2
S. java	1
S. heidelgerg	1
S. stanley	1
S. bovis-morbificans	1
S. lexington	1
S. newport	1
S. houten	1
S. brunei	1
	21

3.2.5 DCP

1. One hundred and forty one specimens were received from PHL Chanthaburi for typing as follows:-

a.	Salmonella	18
b.	Shigella	1
c.	V. cholerae	12
d.	E. coli	94
e.	V. parahaemolyticus	1
f.	Others	9
g.	No growth	6

2. Supply of antisera and antigens to PHL Chanthaburi

a.	Shigella antisera	38 ml.
	Salmonella antisera	40 ml.
	E. coli antisera	19 ml.
b.	Antigens	4,000 ml.

3. Report of Parasitology, Div. of Clinical Pathology

During the months of January to March 1980, Division of Clinical Pathology examined the lungs and G-I tracts of rats for endoparasites that can be human parasitosis. Details of results are given in the table 1 and 2.

Table 1 Angiostrongylus cantonensis found in the lungs

Area	No. examined	No. positive
Toongbencha district, Tamai	10	0
Municipality of Chanthaburi	44	11
Ban Samrong vill., Saikao district	16	0
Chantanimit district	40	8
Total	110	19

Table 2 Endoparasites of rats that can be human parasitosis

Area	No. examined	No. positive			
		Hn	Hd	Rs	Echi.
Toongbencha district, Tamai	10	0	0	0	0
Municipality of Chanthaburi	44	1	0	16	0
Ban Samrong vill. Saikao district	21	0	1	2	0
Chantanimit district	40	0	0	6	3
Total	115	1	1	24	3

Note: Hn = Hymenolepis nana
Rs = *Raillietina siriraji*
Hd = Hymenolepis diminuta
Echi.= Echinostama sp. (adult worms were not examined)

3.2.6 Cholburi

Report of the laboratory activities of hospitals in Cholburi province during January - March 1980 are as follows:

1. Cholburi Hospital

	January	February	March
Bacteriological examination	3,675	6,689	3,713
Serological examination	1,095	1,161	1,059
Parasitological examination	5,232	5,388	4,535
Mycological examination	338	423	310
Haematological examination	8,468	9,514	8,521
Clinical Chemistry examination	3,334	3,002	2,583
Spinal Fluid examination	240	204	112
Urine examination	4,042	5,557	3,506
Sanitation	36	15	118
Others (Media prep. etc.)	117,100	132,500	157,000 cc.

2. Panatnikhom District Hospital

	January	February	March
Blood film for Malarial Parasites	386	319	382
Complete Blood Count	386	319	382
Blood Chemistry	108	118	142
Blood for VDRL	152	80	79
Blood for Serological test	68	62	69
Stool examination	60	53	55
Urine examination	830	710	653
Microbiology	83	62	62

3. Banglamung District Hospital

	January	February	March
Sputum examination	19	8	7
Gram Stain	163	190	167
Blood Film for Parasites	122	110	116
V.D.R.L	204	152	249
Pregnancy Test	71	52	49
Urine examination	331	347	422
Complete Blood Count	51	40	52
Haematocrit	128	105	116
Stool examination and culture	6	3	3
Ractal swab	25	55	74

	January	February	March
F.B.S	13	8	20
B.U.N	5	5	8
Creatinine	3	5	8
Uric acid	2	1	1
Cholesterol	4	4	5
Protein	1	2	2
Bilirubin	1	-	-

4. Ban Bung District Hospital

	January	February	March
Blood film for Malaria	235	164	215
V.D.R.L	58	63	42
Stool examination	6	10	6
Urine examination	67	138	160
Complete Blood count	48	37	37
Acid fast for Bacilli	4	4	3
Gram Stain	4	4	5

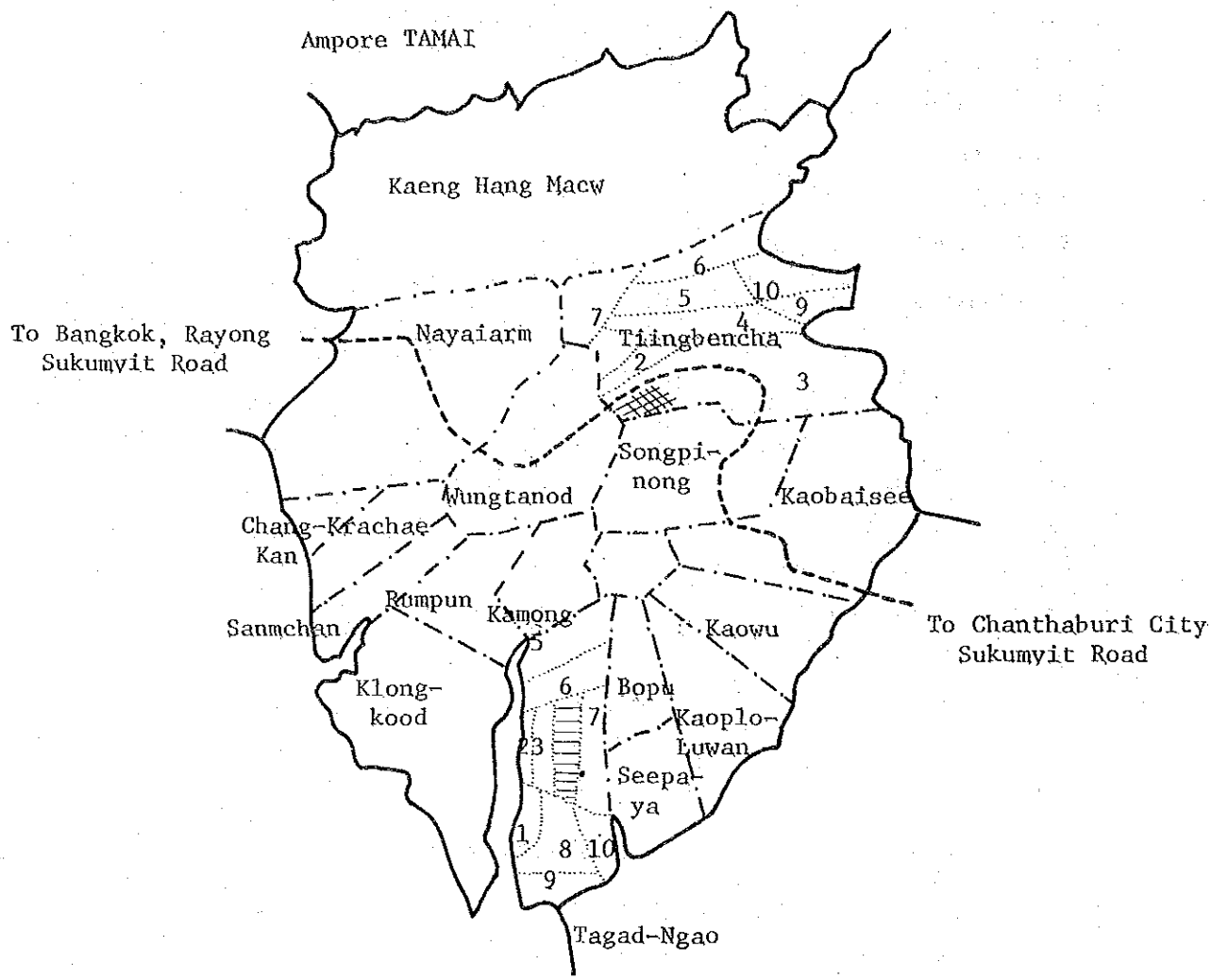
3.3 Activity III

Public Health Activity in Tungbencha Village I (Part 1)

This is the results of clinical, bacteriological, parasitological, hematological, biochemical and epidemiological study performed in Tungbencha village I. This study was a preliminary one. From the result further investigation will be done about what the public health problems are in this particular area. A big effort must be made to improve the situation and the same study will be repeated for evaluating the effort. Therefore, this can be a unit of studies which will be done in Villages in the probject.

Background

Tambon Tungbencha located in Tamai district of Chanthaburi province. Village I is one of ten villages of the tambon. This tambon is penetrated by the route No. 3, Sukumvit road. Most people are working in fruit plantations. They use well water both for plantation and living.



Bacteriological examination performed from May to December 1979 showed highest incidence of bacillary dysentery in Tamai district. Especially in Tambon Tungbencha, 6 cases of Sh.flexneri 1b, one case of Sh.sonnei, Sh.flexneri 2b and Sh.boydii, (total 9 cases of Shigella) were detected from hospitalized patients from this tambon in the Prapokklao Hospital.

Incidence of Bacillary Dysentery in Each District in Chanthaburi

District	Population	Admission, Prapokklao Hospital (6 months)			Case of Bacillary Dysentery			B/A ratio
		No.	%	(A)	No.	%	(B)	
Municipal	78,391	2,697	29.7		30	22.9		0.77
Tamai	88,063	1,988	21.9		40	30.5		1.39
Pongnamron	44,407	1,967	21.8		33	25.2		1.15
Makam	34,726	1,195	12.7		18	13.7		1.07
Klung	42,300	772	8.5		6	4.6		0.54
Lamsing	27,551	494	5.4		4	3.1		0.57
Total	315,528	9,073	100		131	100		

Those cases were the biggest in number among tambons of the province during this period. So that, further survey became necessary to clarify mode of infection of bacillary dysentery which has been wide spread over the province all the year round just like endemic disease.

Village I was selected since the population of the village (390) was adequate for the first study. Bacteriological, parasitological, hemotological, biochemical and epidemiological study is planned. Moreover, medical examination and treatment is given by a medical doctor to villagers as a sort of reward for villagers' cooperation as well as to study villagers' health condition.

Purpose

1. To clarify mode of infection of bacillary dysentery in village I of Tambon Tungbencha.
2. To clarify parasitic infestation in village 1 of Tambon Tungbencha. Complete treatment of parasites among all villagers by giving anthelmintic and follow up study.
3. To examine hematology and biochemistry on blood specimen by taking blood in capillary tube.
4. To examine peoples' health situation and to make epidemiological survey.
5. Mosquito survey.

Plan

1-1 Collect fecal specimens from villagers.
Bacteriological examination is done at PHL for enteropathogens. Inquiry about food habit is filled by health officers. Treatment will be given to shigellosis and salmonellosis only.

1-2 Drinking water and possible infection source (for instance restaurant personnel around the village) are examined.

2-1 The same specimens are used for parasitological study which is done at the PCMO laboratory.

2-2 Pysantel pamoate is given as single dose to all villagers twice in two months. Follow-up study is to be done.

3., 4. On 28th January and 4th February 1980, any visitor is welcome to the Tungbencha health centre where physical examination is done by a doctor from PCMO. From each visitor small amount of blood is taken by capillary tube. Body weight and length measurement is done. Patient history is taken by local health officers. Hemoglobin, hematocrit, total protein, total bilirubin and blood examination for syphilis and malaria are done.

5. Medical Zoological study is done.

I Bacteriological Examination

1. Isolation of Enteropathogenic Bacteria from Villagers

Specimens collected from villagers of Tambon Tungbencha Village I were 138. Three Salmonella and 5 Plesiomonas shigelloides were detected but no case of shigella was found. In January and February 1980 three cases of bacillary dysentery were detected in Village 3, which is next to village I. So that bacteriological study will be done on food shop personnel of Village 3. Many food shops locate along Sukumvit Road and people of Village I usually eat food there. It is strongly suggestive that those food shops may be source of Shigella infection. There is no food shop in Village I. This study is being undertaken. The results will be reported before long.

Isolation of Enteropathogenic Bacteria from Villagers

Age group (years old)	Number of specimens	Number of positive	Salmonella	Plesiomonas Shigelloides
Under 1	3	1	1	-
1 - 4	9	0	-	-
5 - 14	39	1	-	1
15 - 64	80	5*	2	4
Over 65	1	0	-	-
Unknown	6	0	-	-
Total	138	7	3	5

* Two organisms, Salmonella and P.shigelloides were isolated from a single individual.

2. Bacteriological examination of well water at Village I

All villagers depend upon well water there. The results are shown in table.

Bacteriological examination of well water at Tambon Tungbencha

Place	Ammonia free as N	pH	Total count/ml.	Coliform count/ml.	Enteropathogenic organism
Village 1, 36	-	6.0	200	21	-
Village 1, 4	-	6.0	100	11	-
1, 19	-	6.0	1	0	P.shigelloides
1, 21	-	6.0	2	1	P.shigelloides
1, 18	-	6.0	1	0	-

Well water tested so far was fairly satisfactory. It would be better if covers could be applied on the wells in the village and water could be boiled before drinking.

3. Bacteriological examination of food at Village I

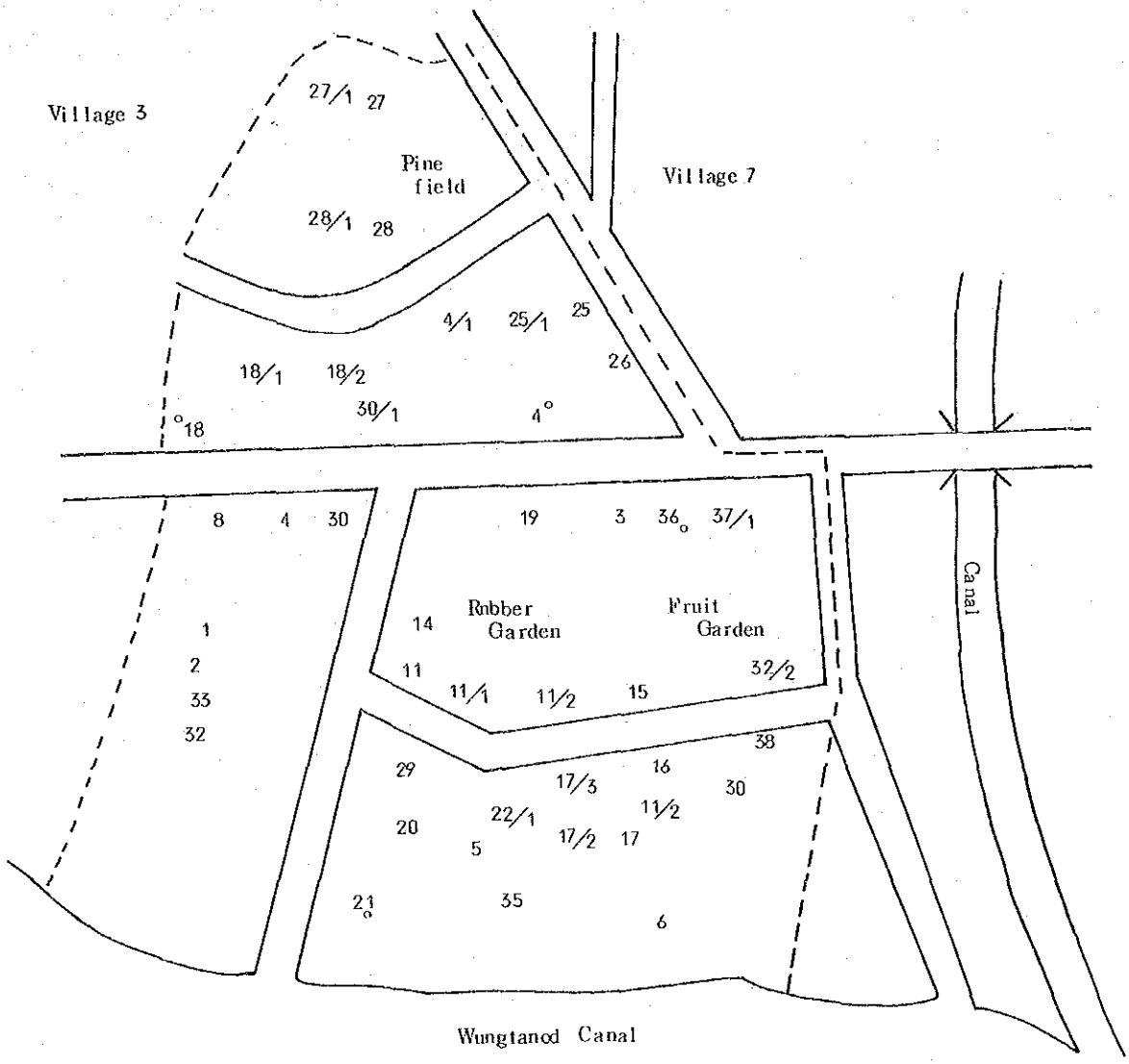
Food collected from several houses at Village I were examined bacteriologically. The results were shown in the Table.

Bacteriological examination of food at Tambon Tungbencha

Specimens	Coliform count/ml.	Enteropathogenic bacteria
Shell fish	0	V.parahaemolyticus
Shrimp	4	V.parahaemolyticus
Fish paste	0	Clostridium perfringens
Pickle (vegetable)	0	-
Vegetable	3,000	-

It can be imagined that probably V.parahaemolyticus infection might be rather common in this area and some vegetables are contaminated by feces or droppings.

Addendum Map of Tungbencha Village I (House Number)



II Parasitological Study at Village I

Along with bacteriological examination of fecal specimens collected from villagers, parasitological examination was also done. The results are shown in the Table.

Report on Parasitic Infection in Tungbencha

Age	Male					Female				
	No. of Exam.	HW	St	To	Ev	No. of Exam.	HW	St	To	Ev
Under 9	12	3				16	2			
10 - 19	10	6				18	8	1		1
20 - 29	7	6		1		10	6			
30 - 39	8	4				5	3		1	
40 - 49	7	3		1		7	4			
50 - 59	3	2				3	2		1	
Over 60	2	2				1	1			
Total	49	26		2		60	25	1	2	1
%		53.0					41.3			

Overall

Infectious rate of Hookworm in Tungbencha ..... 46.8 %

As seen generally in the rural area of Thailand, hookworm infestation rate was high. 53% in male and 41.3% in female subjects showed hookworm infestation.

Three consecutive treatments done in a certain period (in about 3 months) are scheduled. A repeated parasitological study will be followed.

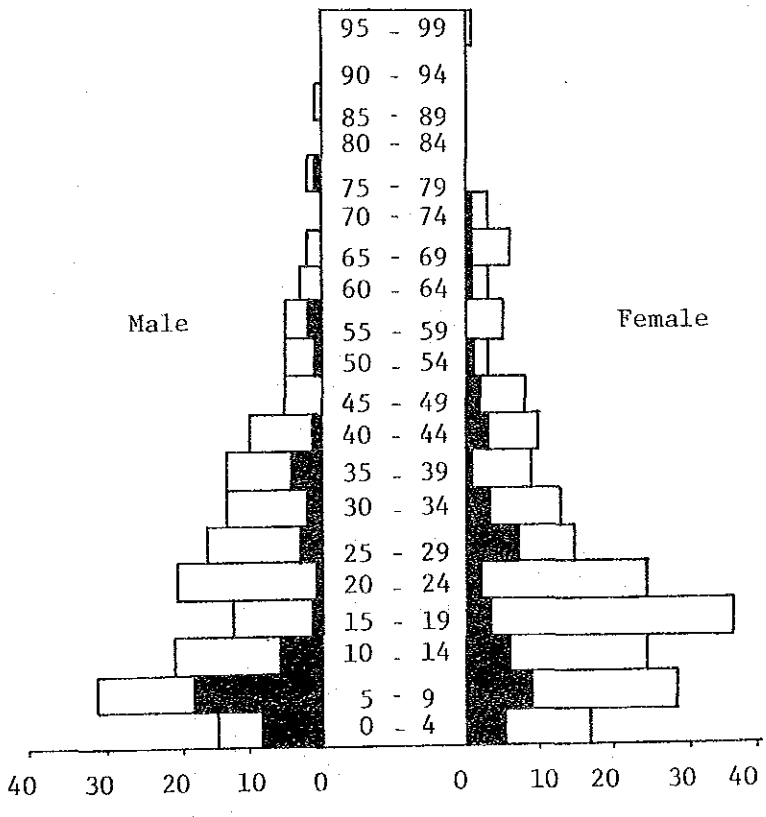
III Medical Examination

Medical team consisting of doctors, nurses, sanitarians and medical technologists came to the public health station in Tungbencha to see patients from Tambon Tungbencha village I on January 28 and February 4, 1980 after letting villagers know about medical service. Visited patients or healthy people (visitors) were 124 from village I and 34 from neighbouring villages. Ratio of visitors from village I to whole population of village I was 23.9% (male 26.7%, female 21.5%). Life table and age distribution of visitors are shown on the figure.

Life Table of Tungbencha Village 1

and

Visitors to the Medical Service (Jan. 28 and Feb. 4, 1980)



As can be seen from the figure, fairly many small children came to see doctors (41.9%) while visitors of working age (15 - 49 years old) were seldom. It is supposed that young adults may be busy or healthier than older people or children.

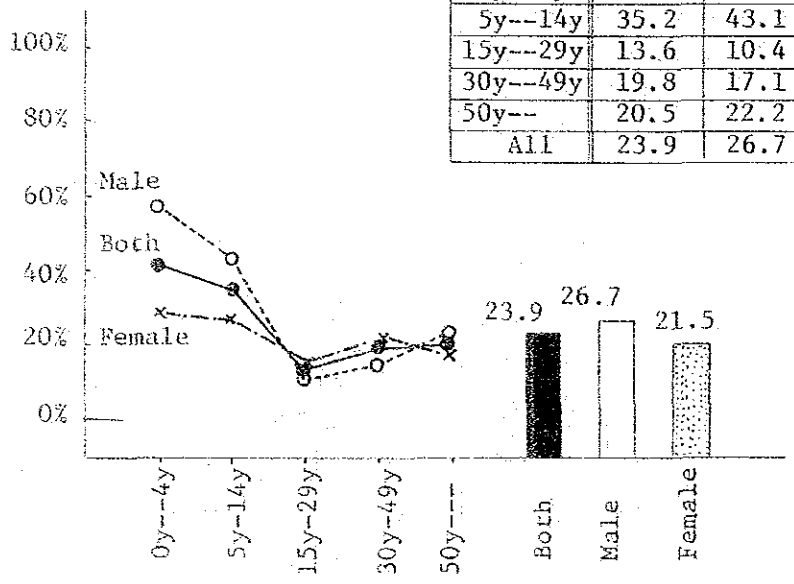
Although this medical service was informed only to the inhabitants of Village No. 1, we had many visitors from other villages. This reflects insufficient real medical service in this area.

Visitors were examined in the following way;

1. Questionnaires on Patient Card (Addendum) were filled by health officers.
2. Measurement of body length and weight.
3. Questionnaires of health condition according to Card of Anammesis (Addendum) by doctors.
4. Medical examination according to Card of physical findings (Addendum).
5. Blood examination.
6. Prescription of medicine with free charge.

% Rate of Visitor to Inhabitant by Age
in the Toong-Ben-Cha Medical Service

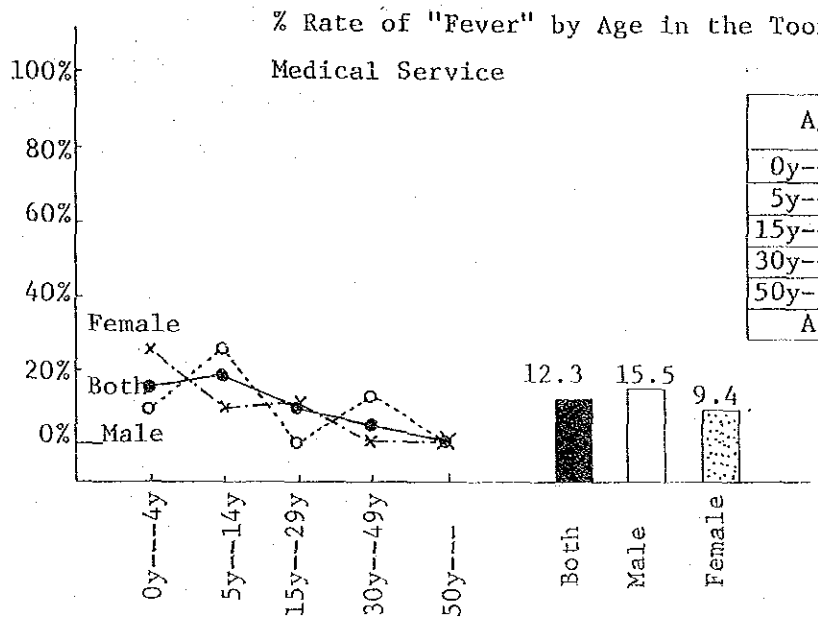
Age	Both	Male	Female
0y--4y	41.9	57.1	29.4
5y--14y	35.2	43.1	27.8
15y--29y	13.6	10.4	15.6
30y--49y	19.8	17.1	22.5
50y--	20.5	22.2	19.0
All	23.9	26.7	21.5



Results

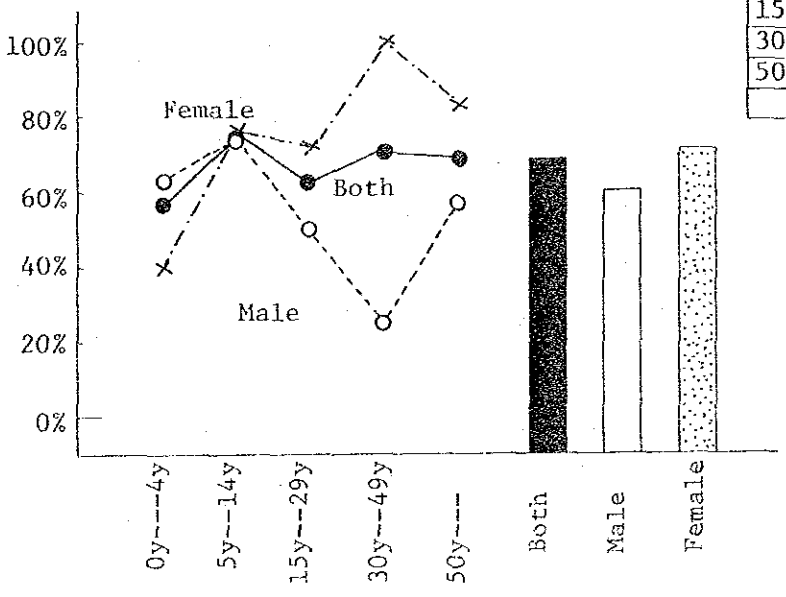
There were many visitors who were diagnosed as upper respiratory diseases (30.4%). Clinical diagnosis of malaria was made in 20.0 %. Many visitors had definite anemia (Hb lower than 11.0 g/100 ml.) (46.4%).

% Rate of "Fever" by Age in the Toong-Ben-Cha Medical Service



Age	Both	Male	Female
0y--4y	15.8	9.1	25.0
5y--14y	18.8	25.9	9.5
15y--29y	9.1	0	11.8
30y--49y	5.0	12.5	0
50y--	0	0	0
All	12.3	15.5	9.4

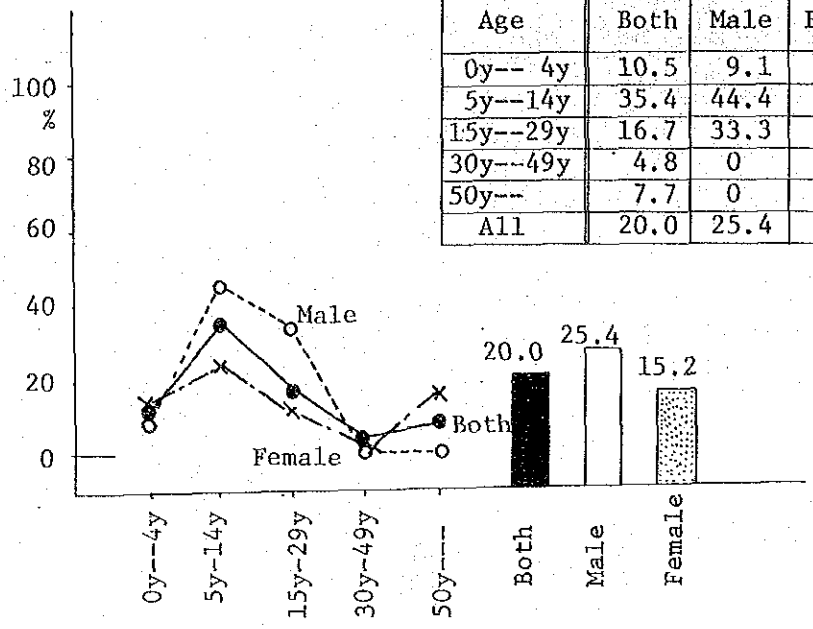
% Rate of "Subjective Symptom--General Fatigue (+)" by Age in the Toong-Ben-Cha Medical Service



Age	Both	Male	Female
0y--4y	57.9	63.6	40.0
5y--14y	75.1	74.1	76.2
15y--29y	62.5	50.0	72.2
30y--49y	71.5	25.0	100
50y--	69.3	57.2	83.3
All	69.6	61.0	72.3

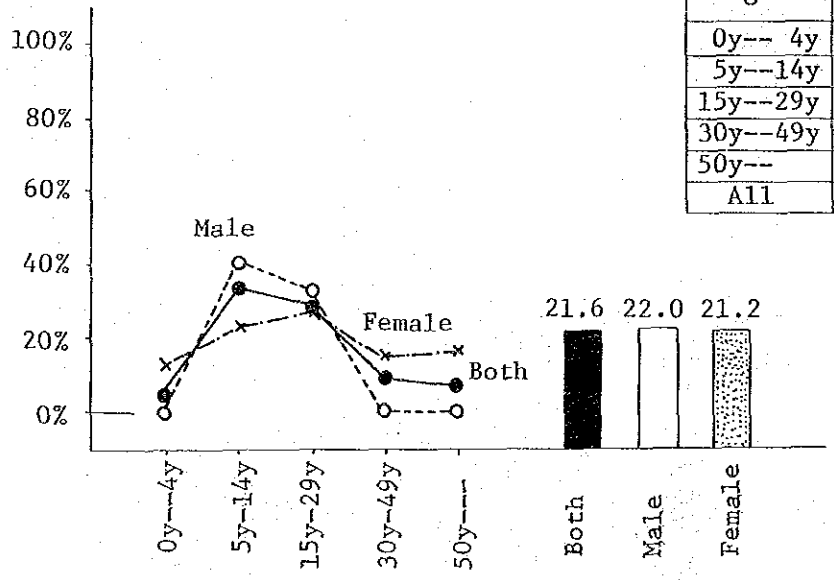
% Rate of the Clinical Diagnosis "Malaria"
to Visitors by age in the Toong-Ben-Cha Medical Service

Age	Both	Male	Female
0y-- 4y	10.5	9.1	12.5
5y--14y	35.4	44.4	23.8
15y--29y	16.7	33.3	11.1
30y--49y	4.8	0	7.7
50y--	7.7	0	16.7
All	20.0	25.4	15.2

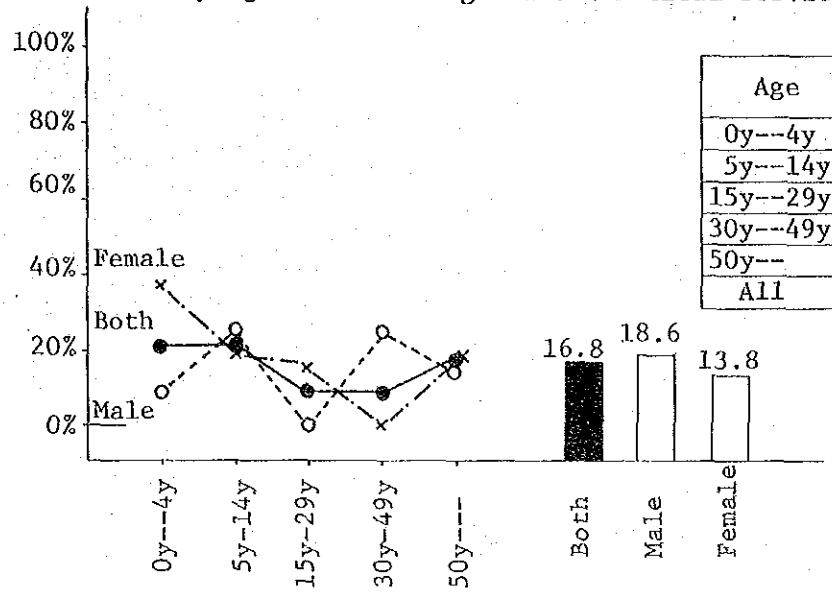


% Rate of "Abnormal enlargement of Spleen"
by Age in the Toong-Ben-Cha Medical Service

Age	Both	Male	Female
0y-- 4y	5.3	0	12.5
5y--14y	33.3	40.7	23.8
15y--29y	29.2	33.3	27.8
30y--49y	9.5	0	15.4
50y--	7.7	0	16.7
All	21.6	22.0	21.2



% Rate of "Abnormal enlargement of Liver"
by Age in the Toong-Ben-Cha Medical Service



Age	Both	Male	Female
0y--4y	21.1	9.1	37.5
5y--14y	22.9	25.9	19.0
15y--29y	9.5	0	15.4
30y--49y	9.5	25.0	0
50y--	15.4	14.3	16.7
All	16.8	18.6	13.8

The followings are signs and symptoms often seen in answer to questionnaires.

a.	Poor appetite	62.4%
b.	General fatigues	69.6%
c.	Headache	68.3%
d.	Back pain	51.0%
e.	Shoulder stiffness	39.2%
f.	Orthostatic dysfunction	41.2%
g.	Cough	48.8%
h.	Sputum	43.0%
i.	Abdominal pain	47.6%

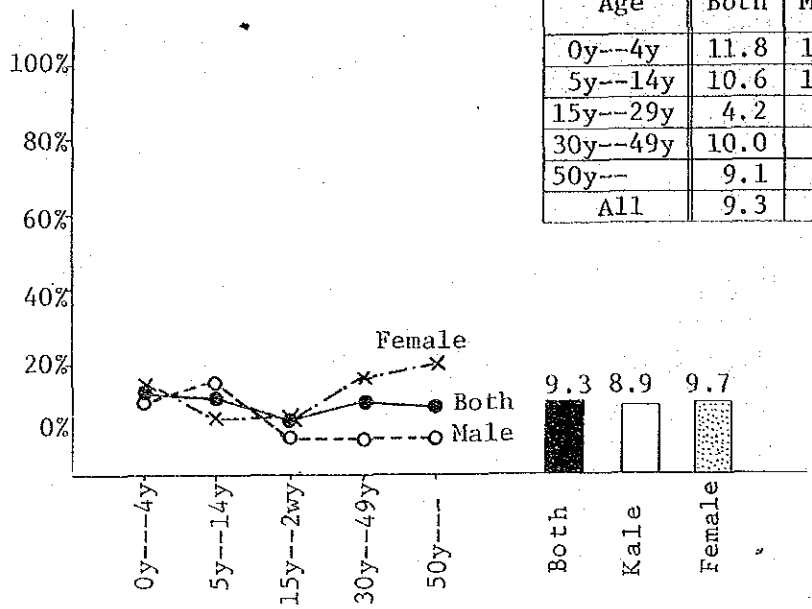
46.7% of visitors of age 15 to 49 years had fallen teeth. Some congenital anomalies (Talipes equinovarus, ventricular septal defect etc.) were found.

The biggest problems in this village were anemia and malaria. Hookworm infestation of villagers studied was 46.8%. They have only 15 latrines in 52 houses (1978). Many cases of malaria were found among children and young adults. About 30% of children showed markedly enlarged spleen. This fact means that children there, have been suffered from plasmodium falciparum infection repeatedly. It seems that children are suffered from malaria more heavily than adult people.

The positive rate of rapid plasma reagin Card test was 9.3%. The test using reliable method will be repeated on the positive cases.

% Rate of "Rapid Plasma Reagin(+) or (±)" by Age
in the Toong-Ben-Cha Medical Service

Age	Both	Male	Female
0y--4y	11.8	10.0	14.3
5y--14y	10.6	14.8	5.0
15y--29y	4.2	0	5.6
30y--49y	10.0	0	16.7
50y--	9.1	0	20.0
All	9.3	8.9	9.7



Conclusion

Although medical service has been given by PCMO, hospitals, public health stations and midwifery stations, the actual service has not yet been sufficient. Resources like efficient man power, institutions or budget are far from satisfaction. People live distant from health personnels. Most important thing to be pointed out is that the present health officers lose their energy before they try to improve villagers' health situation.

As being mentioned, upper respiratory infection, anemia and malaria are the top three illnesses there. For hookworm infestation, repeating treatment is required so that people may develop strength to overcome current infection. For malaria, effective treatment and education to prevent infection should be given.

In this sort of medical service, the efficient measures to control diseases and follow-up shall be continued in future as a model of the real health service.

Addendum 1

Medical Service Card is composed of the following;

(1) Patient Card

1. Tambon
2. District (Amphore)
3. House No.
4. Family Chief
5. Name
6. Age
7. Sex
8. Marriage
9. Body Weight
10. Body Length
11. Date

(2) Anamaesis Card

1. Poor Appetite (1. Many times 2. Sometimes 3. No)
2. General Fatigue
3. Fever
4. Headache
5. Shoulder Stiffness
6. Back Pain
7. Orthostatic Dysfunction
8. Exertional Dyspnea
9. Chest Pain
10. Cough
11. Sputum
12. Nausea
13. Abdominal Pain
14. Diarrhea
15. Constipation
16. Color of Stool
17. Color of Urine
18. Pain at Passing Urine
19. Alcohol
20. Cigarette

(21. Abnormal Genital Bleeding)*

* At this time we did not ask this question.

(3) Card of Physical Findings

1. Face Color (1. Yes 2. No)
2. Skin Disease
3. Conjunctiva bulbi
4. Conjunctiva palpebrae
5. Pterygium
6. Tongue
7. How many Pulled-out Teeth?
8. Tonsil & Pharynx
9. Axillary Lymphnode
10. Lung
11. Heart
12. Tenderness on the Abdomen
13. Enlargement of Liver
14. Enlargement of Spleen
15. Nail
16. Pretibial Edema
17. Fever
18. Scar after Trauma
19. Congenital Anomaly
20. Blood Pressure

(4) Prescription Card

1. Clinical Diagnosis
2. Medicine & Advice

Addendum 3

% Rate of Visitors with Problems to All of Them

1. Hb : 46.4% (43)* Under 11 g/dl
2. Het : 57.7% (71)
3. MCC : 36.0% (45)
4. S.I. : 48.7% (60)
5. T.P. : 0.8% (1)
6. Jaundice (Vissible in Serum) : 21.3% (26)
7. RPR : 9.3% (11)
8. Malaria (Plasmodium +) : 11.6% (5/43)
9. Poor Appetite : 62.4% (78)
10. General Fatigue : 69.6% (87)
11. Fever : 100% (50/50)
12. Headache: 68.3% (84)
13. Shoulder Stiffness : 39.2% (49)
14. Back Pain: 51.0% (61)
15. Orthostatic Dysfunction : 41.2% (41)
16. Exertional Dyspnea : 16.9% (21)
17. Chest Pain: 11.4% (14)
18. Cough : 48.8% (61)
19. Sputum : 43.0% (54)
20. Nausea : 36.1% (44)
21. Abdominal Pain: 47.6% (56)
22. Diarrhea: 16.0% (6)
23. Constipation: 5.6% (7)
24. Stool Color: Red; 0.8% (1), Black; 8.8% (11)
25. Urine Color: Red; 0, Strongly yellow; 23.4% (29)
26. Pain at Passing Urine : 5.6% (7)
27. Face Color: 15.3% (19)
28. Skin Disease: 5.0% (6)
29. Conjunctiva bulbi: Icteric; 4.1% (5), Reddened; 4.1% (5)
30. Pterigium: 4.9% (6)
31. Tongue Coating: 11.2% (14)
32. Pulled-out Teeth (15y--49y) : 46.7% (21/45)* Deficit
33. Axillary Lymphnode: 6.5% (8)

34. Lung : 13.7% (17)
35. Heart : 7.2% (9)
36. Liver : 16.8% (21)
37. Spleen : 21.6% (27)
38. Nail : Clubbed; 1.6% (2), Spooned; 2.4% (3)
39. Abdominal Tenderness : 16.4% (20)
40. Pretibial Edema : 2.4% (2)
41. Fever : 12.3% (15)
42. Scar Trauma: 3.2 % (4)
43. Congenital Anomaly : 2.4% (3)
44. Blood Pressure : 0.8% (1)

IV Laboratory Examination

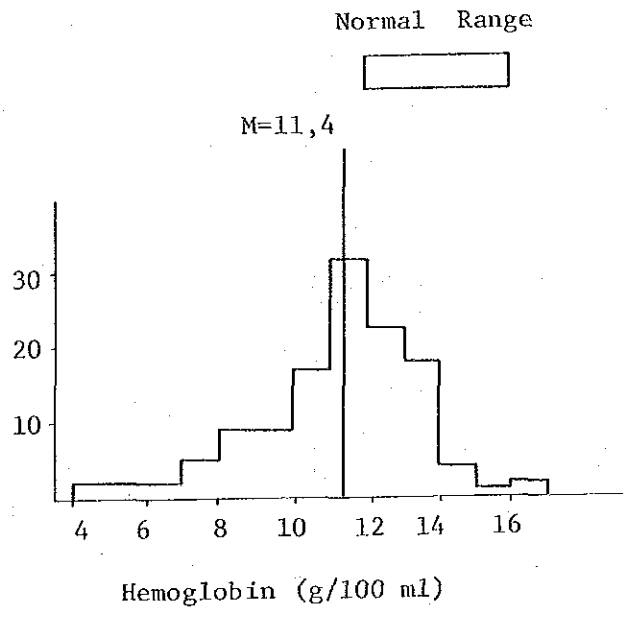
On January 28 and February 4, 1980, medical examination and treatment were given to villagers of Tambon Tungbencha village 1. One hundred and one people who had some complaints came to consult doctors in the health centre on those date from village 1. Those correspond to about 1/4 of whole population of the village. Twenty-three people came there from the neighbouring villages. Altogether 124 people were taken blood by capillaries from finger tip after the medical examination was over.

Hemoglobin, hematocrit, total protein, MCC, Saturation Index (S.I.), R.P.R. card test for syphilis and malaria plasmodium were examined on those specimens. Jaundice + or ++ was described from the colour of sera by a Japanese expert for laboratory technology, T. Miyazaki.

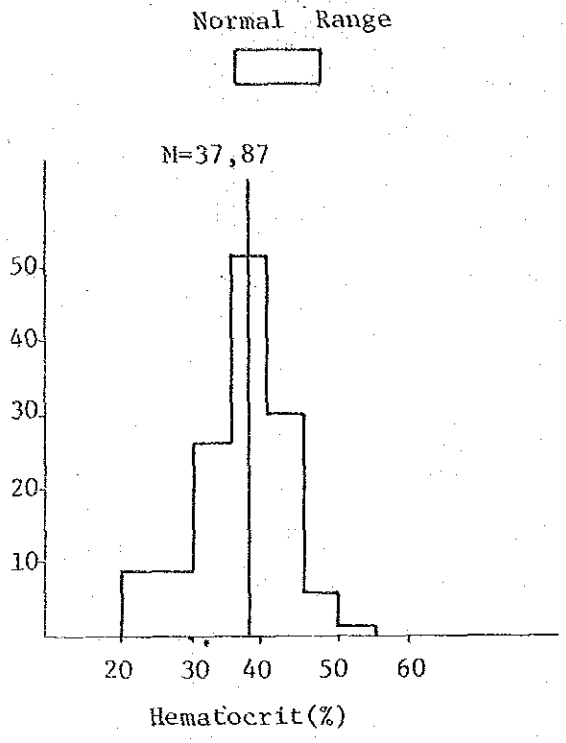
Results

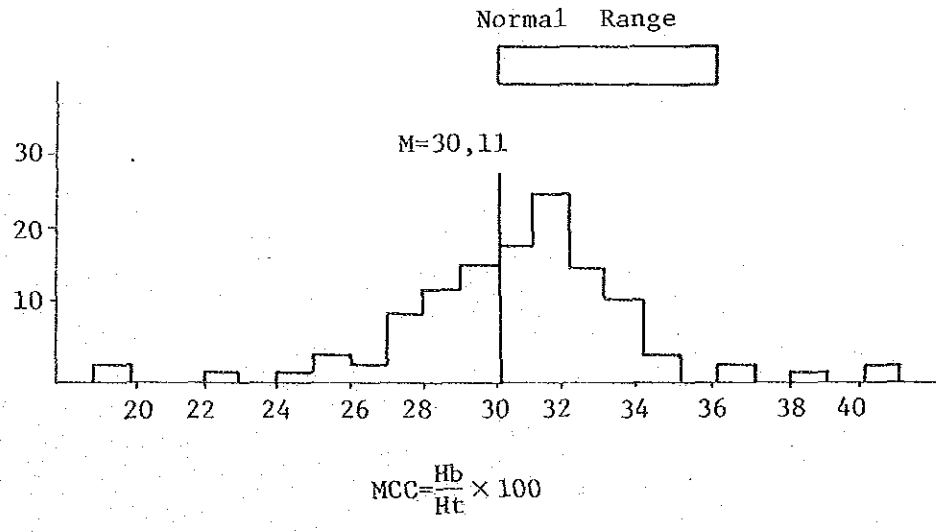
1. Hematological examination

The most predominant finding on blood specimens taken from villagers was low hemoglobin value in whole blood. About 60 % of visitors to the health centre had low level of hemoglobin. Mean value was 11.4 g/100 ml. Although those people came to consult doctors, most adult people were working everyday and school children going to school. Yet, more than half of visitors had anemia more or less.

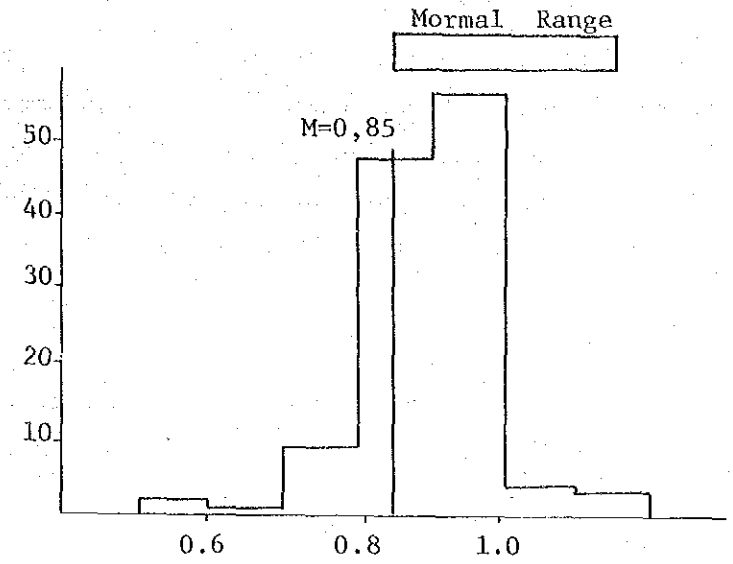


Anemia seen in those villagers may be due to hook-worm infestation or partly due to chronic malaria. Hookworm infestation rate was 53% in male and 41.3% in female subjects in this village.





$$MCC=\frac{Hb}{Ht}\times 100$$

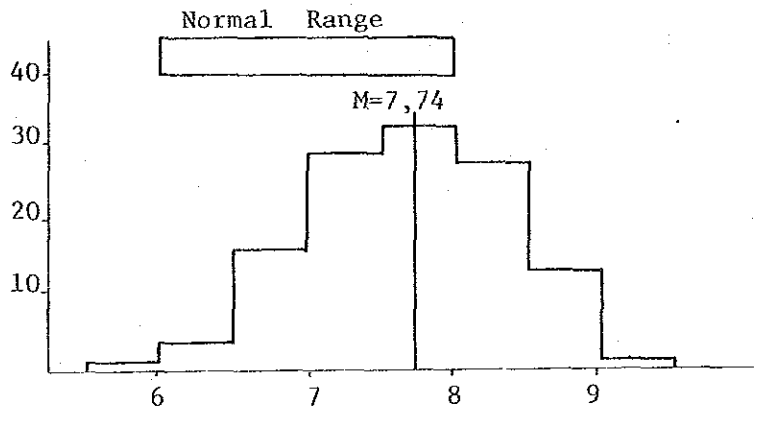


$$S.I.= \frac{Hb}{Ht} \times \frac{45}{16}$$

Hematocrit, MCC and saturation index (S.I.) showed the same tendency. About 30 to 40 % of people visited the health centre showed lower value than normal range. Saturation index showed that in about 30 % of visitors they had hypochromic anemia.

2. Total protein

About 34 % of visitors showed higher total protein value than normal range (6 - 8 g/100 ml.). The protein fraction was not determined. It is, however, imagined that higher total protein is attributed to high globulin value which could be caused by chronic or repeated infection.



Total Protein (g/100 ml)

3. Jaundice

Grade of jaundice + or ++ was described by the colour of sera. Chemical assay of bilirubin was not feasible, since blood specimen was taken by capillary tube. But, about 21% of serum specimens showed dark tone possibly suggestive of jaundice. Apparently some of visitors revealed jaundice also clinically. Some of them were diagnosed as hepatitis at the medical examination.

4. R.P.R. card test for syphilis

About 10 % of visitors showed positive results. The examination using the more accurate method is being repeated on the positive cases.

5. Malaria plasmodium

In this series of blood examination for malaria plasmodium only 4.8 % was found to be possitive, while malaria patients who were diagnosed clinically were about 20 cases (20 %). Plasmodium found was all falciparum.

Table

Result of Laboratory Examination

Examination	Mean	S.D.	2 S.D.
Hb	11.4	2.07	4.15
Ht	37.87	5.23	10.46
P	7.74	0.63	1.26
MCC	30.11	3.07	6.14
S.I.	0.85	0.09	0.18

Jaundice + 19, ++ 7 (20.9 %)

R.P.R. Card Test ± 2, + 10 (9.6 %)

Malaria Pl.f. +6 (4.8 %)

No. of Examinee: Male 53, Female 71

Total 124

V Summary

In this particular village, anemia due to hookworm infestation and malaria must be controlled. Then people will gain strength to overcome current respiratory infection which is widely seen in the villagers. Intestinal infection will decrease by means of sanitary way of life, for instance drinking water after boiling or washing food with plenty of water and not eating fresh sea food. The information is given to the Provincial Public Health Office, health officers in health centre and volunteer communicators, so that they can take necessary step to decrease diseases.

The same study as this preliminary village survey is planned to do also in the three project field tambons. Problems came out in the study shall be enumerated. And the simple way to solve those will be given to each village volunteer and volunteer communicator. After certain period the same study is repeated in villages. And thus the way to improve villagers' health situation would be revised.

This is a principle of this sort of study. Therefore, the present one is only the first trial in series of study and control study done in a control village to the already selected three field tambons. In the next step, one village is selected from each field Tambon and the wide range of studies will be given. This should be supported by volunteer's activities.

(This report is the first of medical survey done in village 1 of Tambon Tungbencha. The bacteriological and medical zoological study will be added to this report.)

3.4 Activity IV

No training activity was performed during this period.

3.5 Activity V

3.5.1 Operational research in Virology

Sero-epidemiological surveys of arbovirus in Chanthaburi

In order to study transmission rates of DHF in hyper endemic areas of Chanthaburi Province. Paired bloods specimens were collected from healthy persons of all age groups in 3 tambons (Tamai; Muang, Koh Khwang; Tamai, Kao Wua;) by using blood sampling paper.

Eight hundred and seventy four specimens were collected in July and December 1979 from the same subject (393 specimens from area applied insecticide and 481 specimens from area not applied insecticide). The sera were tested for HI antibodies against Den-2, Den-4 and Chikungunya antigens.

The results of the study shown in Tables 1 to 5 and Fig. 1.

Table 1. Transmission rates of dengue and chikungunya viruses in various areas in Chanthaburi, 1979

Areas Amphor, Tambol		No. Tested	Dengue		Chikungunya	
			Sero convert	Ab. response	Sero convert	Ab. response
With insecticides	Tamai, Tamai	393	31/69(44.9%)	21/324(6.5%)	2/333 (0.6%)	0/60 (0%)
No insecticides	Muang, Koh-Khwang	402	36/49(73.5%)	5/353(1.4%)	1/353 (0.3%)	2/49 (4.1%)
	Tamai, Kao-Wua	79	0/8 (0%)	2/71 (2.8%)	1/55 (1.8%)	0/24 (0%)
		481	36/57(63.1%)	7/242(1.6%)	2/408 (0.5%)	2/73 (2.7%)
Total		874	67/126(53.2%)	28/748(3.7%)	4/741 (0.5%)	2/133(1.5%)

Fig. in parentheses: %

Table 2 Transmission rates of dengue and Chikungunya in Chanthaburi in 1979 by ages

Age in years	No. tested	Dengue		Chikungunya	
		Sero convert	Ab. response	Sero convert	Ab. response
<1 - 4	145	17/28 (60.7%)	2/117(1.7%)	1/137 (0.7%)	0/8 (0%)
5 - 9	430	42/87 (48.3%)	18/343(5.2%)	2/399 (0.5%)	1/31 (3.2%)
10 - 14	161	7/10 (70.0%)	6/151(4.0%)	0/132 (0%)	0/29 (0%)
15 - 19	44	0/0 (0%)	1/44 (2.3%)	0/30 (0%)	0/14 (0%)
20 - 24	15	1/1 (100%)	0/14 (0%)	0/9 (0%)	0/6 (0%)
25 - 34	41	0/0 (0%)	1/41 (2.4%)	0/19 (0%)	1/22 (4.5%)
- 35	38	0/0 (0%)	0/38 (0%)	1/15 (6.7%)	0/23 (0%)
Total	874	67/125(53.2%)	28/748(3.7%)	4/741 (0.5%)	2/133(1.5%)

Table 3 Transmission of dengue and Chikungunya viruses in Chanthaburi, 1979

Areas	Age in years	No. tested	Dengue		Chikungunya	
			Sero convert	Ab. response	Sero convert	Ab. response
With insecticide application	<1- 4	24	4/5 (80%)	0/19 (0%)	1/20 (5%)	0/4 (0%)
	5- 9	276	24/60 (40%)	17/216(7.9%)	1/248 (0.4%)	0/28 (0%)
	10-14	69	3/4 (75%)	3/65 (4.6%)	0/50 (0%)	0/19 (0%)
	15-19	19	0/0 (0%)	1/19 (5.3%)	0/12 (0%)	0/7 (0%)
	20-24	0	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
	25-34	2	0/0 (0%)	0/2 (0%)	0/1 (0%)	0/1 (0%)
	-35	3	0/0 (0%)	0/3 (0%)	0/2 (0%)	0/1 (0%)
	Total	393	31/69 (44.9%)	21/324(6.5%)	2/333 (0.6%)	0/60 (0%)
No insecticide application	<1- 4	121	13/23 (56.5%)	2/98 (2.0%)	0/117 (0%)	0/4 (0%)
	5- 9	154	18/27 (66.7%)	1/127(0.8%)	1/151 (0.7%)	1/3 (33.3%)
	10-14	92	4/6 (66.7%)	3/86 (3.5%)	0/82 (0%)	0/10 (0%)
	15-19	25	0/0 (0%)	0/25 (0%)	0/18 (0%)	0/7 (0%)
	20-24	15	1/1 (100%)	0/14 (0%)	0/9 (0%)	0/6 (0%)
	25-34	39	0/0 (0%)	1/39 (2.6%)	0/18 (0%)	1/21 (4.8%)
	-35	35	0/0 (0%)	0/35 (0%)	1/13 (7.7%)	0/22 (0%)
	Total	481	36/57 (63.1%)	7/424(1.6%)	2/408 (0.5%)	2/73 (2.7%)
Total		874	67/126(53.2%)	28/748(3.7%)	4/741 (0.5%)	2/133 (1.5%)

Table 4 Geometrical Mean titer GMT of the HI tests or human sera collected in Chanthaburi, 1979

Areas	Age in years	No. tested	D-2		D-4		Chik.	
			Pre	Post	Pre	Post	Pre	Post
With insecticide application	<1- 4	24	32	41	21	25	17	16
	5- 9	276	42	71	52	70	13	13
	10-14	69	60	96	76	122	19	21
	15-19	19	77	107	149	207	29	33
	20-34	-	-	-	-	-	-	-
	25-34	2	80	113	113	113	40	57
	-35	3	40	50	40	63	20	20
No insecticide application	<1- 4	121	36	33	24	29	11	11
	5- 9	154	43	59	28	33	10	11
	10-14	92	57	81	53	70	13	13
	15-19	25	64	78	68	87	18	18
	20-24	15	50	73	76	106	25	28
	25-34	39	67	96	106	154	35	41
	-35	35	55	80	82	110	35	44
Total	<1- 4	145	35	34	23	28	12	12
	5- 9	430	42	66	41	54	12	12
	10-14	161	58	87	62	89	15	16
	15-19	44	69	89	95	126	22	24
	20-24	15	50	73	76	106	25	28
	25-34	41	68	96	107	152	35	41
	-35	38	54	77	77	105	33	41

Table 5 Difference of GMT between the serum specimens taken in pre and post-epidemic season in Chanthaburi, 1979

Area	Age in Years	1979		
		D-2	D-4	Chik.
With insecticide	<1- 4	9	4	-1
	5- 9	29	18	0
	10-14	36	45	2
	15-19	30	58	4
	20-24	-	-	-
	25-34	33	0	17
	-35	10	23	0
No insecticide	<1- 4	-3	5	0
	5- 9	16	5	1
	10-14	24	17	0
	15-19	14	19	0
	20-24	23	30	3
	25-34	29	48	6
	-35	25	28	9
Total	<1- 4	-1	5	0
	5- 9	24	13	0
	10-14	29	27	1
	15-19	20	31	2
	20-24	23	30	3
	25-34	28	45	6
	-35	23	28	8

3.5.2 Analysis on causative agents of GI diseases

a. Detection of enteropathogens from diarrheal patients

Detection of enteropathogens from diarrheal patients admitted or treated in the Prapokklao Hospital and four district hospitals from January to March 1980 is shown in Table 1.

The detection rate of V.parahaemolyticus was highest in the last year but that of Shigella was higher than the former in this period.

In this year outbreak of cholera occurred rather frequently in whole Thailand. In Chanthaburi province, 19 cases of cholera patients and healthy carriers were found.

S.typhi was positive in one case.

It was remarkable that 26 cases of Edwardsiella tarda were detected from diarrheal cases. Twenty cases of 26 were from small children or infants. However, the pathogenicity of this organism to enteritis has not yet been established. The study on this matter is the future problem.

In majority of cases one pathogen was detected from a patient. But, in 7% of all cases studied, more than 2 pathogens have been detected from a patient.

b. Cholera outbreak

Cholera outbreak in February and March 1980 was shown in Table 2 and Figure 1.

Total cases were 12, 5 in February and 7 in March. One case among them was from Trad province. In case of cholera outbreak, patients' family, neighbours and restaurants personnels are examined. In February 305 and in March 233 examinations were done and 7 cases of V. cholerae were detected among those people. The all strains detected were V. cholerae, eltor, serotype Ogawa and all susceptible to any kind of antibiotics studied.

Table 1

Isolation of Enteropathogenic Bacteria from Diarrheal Cases

January - March, 1980

	January	February	March
No. of specimens	771	825	960
No. of patients	369	504	570
No. of positive	91 (24.7%)	119 (23.4%)	117 (20.5%)
V. cholerae	-	5	6
NAG Vibrio	3	3	3
V. parahaemolyticus	22	35	30
Shigella	27	35	32
S. typhi	-	1	-
Other Salmonella	3	1	5
Enteropathogenic E. coli	17	7	12
P. shigelloides	6	21	8
Edwardsiella tarda	6	2	14
Shigella + P. shigelloides	2	3	-
Shigella + NAG Vibrio	1	-	-
Shigella + E. tarda	-	-	1
Shigella + V. parahaemolyticus	-	1	-
Salmonella + E. coli	1	-	-
V. parahaemolyticus + P. shigelloides	3	3	1
V. parahaemolyticus + E. coli	-	-	1
V. parahaemolyticus + V. cholerae	-	-	1
NAG Vibrio + Salmonella	-	-	1
E. coli + E. tarda	-	1	2
V. parahaemolyticus + Salmonella + P. shigelloides	-	1	-

Table 2

Outbreak due to Vibrio cholerae

January - March, 1980

Cases	Date	Place	Patient	Contact
1	18 Feb.	Marbpai, Klung	1	-
2	19 Feb.	Parknam, Laemsing	2	1
3	20 Feb.	Chantanimid, Muang	2	1
4	3 Mar.	Takian Tong, Makam	1	-
5	4 Mar.	Bang Gacha, Muang	1	1
6	4 Mar.	Tokprom, Klung	1	-
7	9 Mar.	Nongtakong, Pongnamron	1	2
8	20 Mar.	Muang, Trad	1	-
9	16 Mar.	Parknam, Laemsing	1	-
10	24 Mar.	Wat., Muang	1	2
Total			12	7

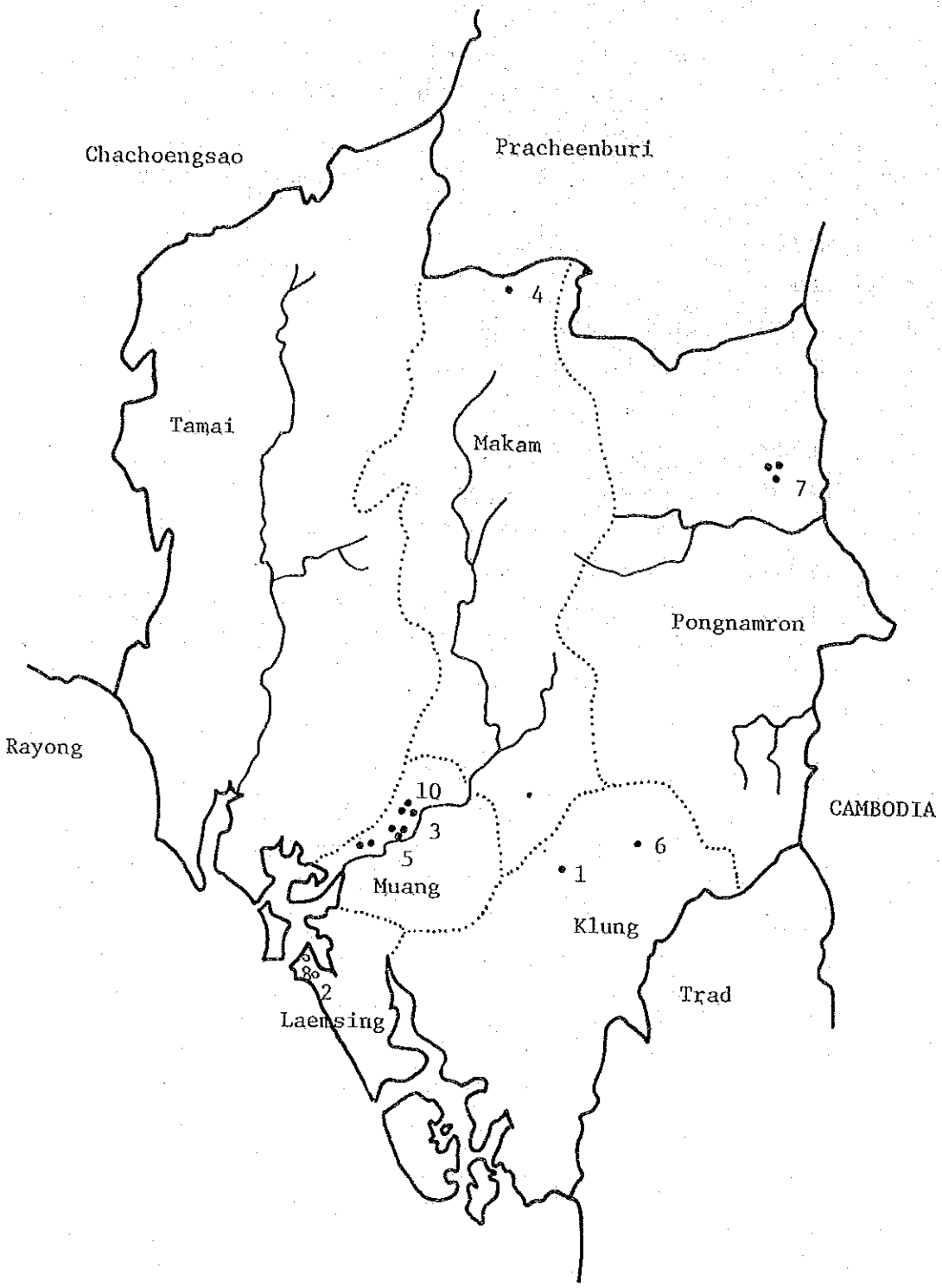


Figure 1

Geographical distribution of Cholera

Jun. - Mar., 1980

Table 3

Geographical Distribution of Bacillary Dysentery in Chanthaburi Province

January - March, 1980

	Muang	Tamai	Klung	Makam	Laemsing	Pongnamron	Total
S. dysenteriae 2	1	-	-	-	-	2	3
S. flexneri 1b	7	13	3	3	1	7	34
2b	3	1	1	3	1	3	12
4	2	2	-	-	1	1	6
4a	-	-	-	-	1	-	1
S. boydii 2	-	1	-	-	-	2	3
S. sonnei	4	2	2	1	-	1	10
Total	17	19	6	7	4	16	69

c. Survey on parasitic Infestation in School Children

A survey of parasitic infestation of school children in project field areas (Tambon Tagad-Ngao, Tambon Bo and Tambon Saikao) was done. The method of this study was described in the previous Progress Report. Microscopic examination was done by M. Hasegawa, Ph. D. The detail will be published elsewhere. The summarized results are shown in the table.

The highest infection rate was seen in Tambon Saikao and the lowest in Tambon Tagad-Ngao. Anthelminthic was given to school children. The same study will be repeated every year.

Table

Results of the survey on parasitic rate of helminthes in school children in three tambons

	Sai-Khao	Tagad-Ngao	Bo
Ss	4.2 %		0.4 %
To	3.8	2.4 %	0.6
HW	38.3	21.7	26.1
Tt	1.9	11.8	0.2
Al	1.3	5.8	3.0
Fh	0.6		
Op		0.4	0.2

Remarks: Ss = Strongyloides stercolaris
To = Trichostrongylus orientalis
Tt = Trichuris trichiura
Op = Opistorchis sp.
Ev = Enterobius vermicularis
HW = Hook worm
Al = Ascaris lumbricoides
Fh = Fasciola hepatica

March 31, 1980

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